

CONSTRUCTION ENGINEERING RESEARCH LAB (ARMY) CHAMPAIGN IL F/G 5/9
 DIRECTORY OF CONSTRUCTION ENGINEERING PROGRAMS IN ORGANIZATION --ETC(U)
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DIRECTORY OF CONSTRUCTION ENGINEERING PROGRAMS
IN
ORGANIZATION AND MANAGEMENT OF CONSTRUCTION

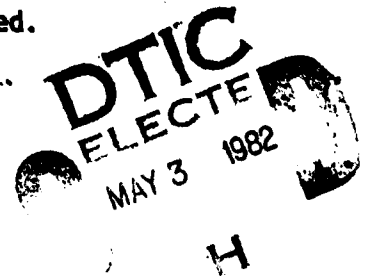
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STUDIES AND DOCUMENTATION
W-65 COMMISSION ON
ORGANIZATION AND MANAGEMENT OF CONSTRUCTION

MARCH 1982

DEPARTMENT OF THE ARMY
CONSTRUCTION ENGINEERING RESEARCH LABORATORY
CHAMPAIGN, ILLINOIS USA

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| 19. KEY WORDS (Continue on reverse side if necessary and identify by block number) construction management universities directories | | |
| 20. ABSTRACT (Continue on reverse side if necessary and identify by block number) This second edition of a directory of education programs in engineering and management covers 55 programs in 30 countries. CIB Working Commission 65, Organization and Management of Construction, plans to update the directory periodically. | | |

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EDITION OF 1 NOV 65 IS OBSOLETE

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PROLOGUE

The Working Commission W-65, Organization and Management of Construction, (OMC) consists of experts who are addressing research contained in the terms of reference which reads in part: "To develop effectiveness calculations and techniques for evaluating singularly and collectively various organizational forms utilized in planning, architecture, engineering, construction and for industrialized construction." A major aspect of the program is to effect the transfer of the research into professional practice; a vital mechanism in this transfer are the educational programs in engineering and management.

To facilitate the interchange among experts in education for OMC the Commission recommended the publication of a Directory of education programs. This is the second edition of the Directory. W-65 intends to update this Directory on a regular basis. Information on additional educational programs is welcomed; it should be forwarded to Dr. V. Handa of the Waterloo Construction Council, University of Waterloo, Waterloo, Ontario, CANADA N2L 3G1. Additional copies of the Directory are available at a modest charge from the National Technical Information Service (NTIS), Springfield, VA 22151, USA.

This Directory is the result of the efforts of many individuals. The work of the late Mr. D. Aird for the study part of the Directory is worthy of special recognition. The survey would not have been possible without the aid of the University of Waterloo and the Waterloo Construction Council.

Information on W-65 can be obtained by contacting the undersigned at the US Army Construction Engineering Research Laboratory, P. O. Box 4005, Champaign, IL 61820, USA. Information on CIB can be obtained by contacting the Secretary General CIB, Postbus 20704, Weena 704, Rotterdam, HOLLAND.

23 March 1982
Champaign, Illinois, USA

L. R. SHAFFER
Coordinator, W-65

| | |
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CIB-W65 STUDY OF CONSTRUCTION PROGRAMMES

OBSERVATIONS OF REPLIES

The Study elicited responses from some 55 institutions of which 26 were located in the United States ("USA") and 29 in Other countries ("Other"). These schools offer the following programmes:

| | <u>USA</u> | <u>OTHER</u> | <u>TOTAL</u> |
|------------|------------|--------------|--------------|
| BACHELOR'S | 22 | 12 | 34 |
| MASTER'S | 15 | 14 | 29 |
| DOCTORATE | 9 | 9 | 18 |

The observations which follow are necessarily generalized since the questionnaire was subject to some interpretation; some questions were not answered; and in a few cases the response data apparently referred to other than construction programmes alone (usually departments/faculties of civil engineering or architecture). Nevertheless, the results should be of some interest.

THE INSTITUTIONS

Generally, Schools of Construction are relatively new. Most Bachelor-level programmes were established during the 1960's and 1970's, although two programmes in the USA date back over 75 years. Graduate-level programmes slightly pre-date the Bachelor schools in the USA where several were established in the 1950's. Almost all graduate programmes in the Other countries were set up only within the last decade.

Virtually all Bachelor programmes are of 4 year's duration after entry from high school. Master's degrees usually require 1 to 1½ years in the USA and 1½ to 2 years in Other countries where the entrance requirement is a Bachelor's degree. To obtain a Doctorate will uniformly require a minimum of three years beyond the Master's degree.

The size of the institutions, as defined by full-time student enrollments, varies widely:

| | USA | | OTHER | | TOTAL | |
|------------|--------------|--------------|--------------|--------------|--------------|--------------|
| | <u>RANGE</u> | <u>AVER.</u> | <u>RANGE</u> | <u>AVER.</u> | <u>RANGE</u> | <u>AVER.</u> |
| BACHELOR'S | 5 - 430 | 105 | 20 - 450 | 130 | 5 - 450 | 114 |
| MASTER'S | 1 - 45 | 15 | 1 - 40 | 9 | 1 - 45 | 12 |
| DOCTORATE | 1 - 9 | 5 | 1 - 11 | 3 | 1 - 11 | 4 |

Part-time students do not comprise a significant portion of enrollments in Bachelor's programmes. Only in 4 USA and 2 Other institutions are part-time programmes substantial at the undergraduate level. On the other hand, one-quarter of the graduate programmes in the USA have large part-time enrollments, and over one-half of the Other programmes at this level provide for part-time students on a large scale.

Foreign students comprise only 3% of enrollment in Bachelor's programmes in the USA and 8% in Other countries. At the Master's level Other countries retain about the same proportion of foreign students (9%) but in the USA this figure reaches over 50%.

THE PROGRAMMES

Programmes leading to a Bachelor's degree in the USA almost uniformly require 124 - 138 semester hours, or equivalent, study. Responses from Other countries are difficult to interpret but since nearly all such programmes are of 4 year durations, the course loads appear to be equivalent.

At the Master's level, typical course requirements are approximately 30 semester hours in the USA. The common response from Other countries averages 8 - 9 "courses" (range is 7 - 12 "courses") which implies a somewhat heavier course load, than in the USA, even allowing for the additional time durations discussed earlier.

Typically there is no thesis requirement for a Bachelor's degree in the USA. About one-third of the Other institutions require a thesis.

Over half the USA Master's programmes do not require a thesis, and a few others make it optional. In contrast, most Other programmes do require a thesis, and those which don't, demand completion of a major study report.

Virtually all Doctoral degrees require a thesis.

The specifics of courses which are included within the Construction programmes are almost infinitely variable. Very little commonality can be observed from the survey responses except that core courses for USA programmes do display some evidence of consistency (or popularity). This is likely due to the influence of the Associated Schools of Construction or the American Council for Construction Education.

The following course topics are listed in decreasing order of their mention in the survey. (Note that more than one course of a given topic may be offered within a single programme.)

- Construction Estimating and Bidding
- Construction Management
- Building Structures
- Mechanical/Electrical Equipment
- Construction Methods and Equipment
- Construction Materials
- Construction Planning and Control
- Construction Techniques
- Construction Contracts
- Drawing/Graphics
- Introduction/History of Construction
- Computers; simulation
- Site Development
- Surveying
- Labour Relations
- Environmental Systems

SCHOLARSHIPS

Perhaps three-quarters of all the Institutions offer some scholarships or other financial incentives. However, the general impression is that these are very limited both in number and amount.

SOURCES OF FUNDING

Costs of Administration are almost entirely funded by government everywhere. Four schools (2 in USA and 2 in Other countries) are supported by industry in this respect, and represent an interesting exception. Two private schools in USA obtain administrative funding from other sources.

Scholarships are funded predominantly by governments, but also substantially by industry especially in the USA. Private sources of scholarships is important to the private schools.

Research funds, again, depend heavily upon government grants or contracts, particularly in Other countries. Industry support represents probably 10 - 15% of total research funding in both the USA and Other countries.

STAFFING

Most schools function with quite restricted numbers of faculty, as summarized below:

| | <u>USA</u> | | <u>OTHER</u> | |
|-----------|--------------|--------------|--------------|--------------|
| | <u>Range</u> | <u>Aver.</u> | <u>Range</u> | <u>Aver.</u> |
| Full Time | 1 - 8 | 3 | 0 - 10 | 4 |
| Part Time | 0 - 25 | 3 | 0 - 10 | 2 |
| Guests | 0 - 12 | 0 | 0 - 20 | 5 |

It is interesting to note that schools in USA split evenly between full and part-time faculty and do not utilize guest lecturers. In contrast, Other countries have a slightly larger core of full time instructors and use guest lecturers to a substantial extent.

INDUSTRY INPUT

The survey requested information on the type of input provided by industry to the programmes. This was divided into four categories with the response as shown (percentage of schools deriving support as defined):

| | <u>USA</u> | <u>OTHER</u> | <u>TOTAL</u> |
|-----------------------------------|------------|--------------|--------------|
| Financial, Administrative | 25% | 10% | 20% |
| Scholarships, Bursaries, etc. | 80 | 30 | 50 |
| Curriculum Development | 50 | 25 | 40 |
| Overseeing Body, Industry Liaison | 40 | 35 | 40 |

It is significant that USA schools obtain substantially larger participation by industry in both Scholarships and Curriculum Development.

RESEARCH

Educational objectives of the Construction Schools are reasonably consistent amongst both USA and Other countries.

Perhaps surprisingly not a single institution indicated Research as an objective. Almost all respondents focussed on Organizational objectives, while over one-third also saw Engineering as an objective.

The lack of emphasis on research and thesis requirements perhaps explains the insignificant amounts of research funding reported. Only nine responses indicated research funding greater than \$50,000 per annum.

Research projects reported include:

- ° Management functions, organization, etc. (11 times)
- ° O.R. Techniques, Computer Simulation (9 times)
- ° Building economics, financing, risk (5 times)
- ° Building Sciences, (5 times)
- ° Planning, Scheduling, Estimating (5 times)
- ° Productivity on Site, Methods (5 times)
- ° Energy conservation (2 times)

No other topic received more than a single reference.

PROGRAMME LISTINGS

February 17th, 1981.

Name of Institution **UNIVERSITY OF WATERLOO**

Faculty/School **DEPT. OF CIVIL ENGINEERING, CONST. MGMT. GROUP**
address **UNIVERSITY OF WATERLOO, WATERLOO, ONT. CANADA N2L 3G1.**

Name, Title of Contact **Dr. W.A. McLaughlin, Director**
Name, Title of Respondee **Prof. Dr. V.K. Handa, Professor.**

| Programme/s offered | Degree Bachelor | Degree Master | Degree Ph.D | Non-deg. Diploma | Non-deg. Certificate | Part of Programme | Other Specify |
|---------------------|-----------------|---------------|-------------|------------------|----------------------|-------------------|---------------|
|---------------------|-----------------|---------------|-------------|------------------|----------------------|-------------------|---------------|

| | | | | | | | |
|--|------------|------|------|--|--|---------------------------|--|
| Year Programme Established | 1971 | 1971 | 1961 | | | | |
| Duration (years) - length of Programme | 12 months. | | | | | (as part of B.Sc degree). | |

Enrollment

| | | | | | | | |
|--------------------------|----|---|--|--|--|----|--|
| Current Part Time | 11 | | | | | | |
| Current Full Time | 8 | 1 | | | | 60 | |
| Other (specify) of which | | | | | | | |
| National | 13 | | | | | 60 | |
| Foreign | 6 | 1 | | | | | |

Admission Requirements **B.Sc. (Eng.) or equivalent.**

| | | | |
|---|--------------|---|------|
| Course Requirements - list number of courses needed whether thesis or not | 8 + project. | 6 | N/A. |
|---|--------------|---|------|

| | | | |
|---|------|----|------|
| Scholarship, Fellowship Bursaries, etc. available | Yes. | No | N/A. |
|---|------|----|------|

Language of Instruction **ENGLISH**

| | | |
|-------------------------------------|--------------------|------------------|
| Total Numbers of Students Graduated | National 72 | Foreign 8 |
|-------------------------------------|--------------------|------------------|

| | Administration | Scholarship | Research |
|-------------------------------------|---|------------------|-----------|
| Indicate % of funding by Government | - | Research Agency. | NRC, 100% |
| Industry | 50 | 50 | - |
| Other (specify) | from fees and govt. granting formula by Univ. | | - |

| | | |
|--------------------------------------|-------------------------------------|---|
| Staff Numbers: Totals (Indicate #'s) | Faculty Full Time (3) Part Time (1) | Industry, Instructors (20) Speakers |
|--------------------------------------|-------------------------------------|---|

| | |
|------------------------------|--|
| Industry Input (Please tick) | Financial Administrative (✓) Curriculum Development (✓) Scholarship, Bursaries etc. (✓) Overseeing Body Industry Liaison (✓) |
|------------------------------|--|

Comments

Course, Titles, Descriptions
Indicate Text Title (if any)

CE 691 Construction Economics.

Accounting and Financing

Supply demand and production, breakeven analysis, minimum-cost operations, time-value mechanics, comparison methods, economic analysis recognizing risk, cost accounting, profit and loss statements, return on investment, financing, analysis and interpretation of financial statements, fraud and waste, principles of internal control, profit centre concepts, taxes and other legal considerations.

CE 692 Organizational and Legal

Responsibilities in Construction

Emergence and dimensions of management, tasks, management effectiveness, social impacts and environmental responsibilities, management skills and organizations. Construction contracts, breach of contract, mechanics liens, liability for defects, professional liability, insurance, construction safety and environmental protection legislation

CE 693 Administration of Construction Projects

Nature of the construction industry, characteristics of a project, construction projects, planning, and scheduling functions, bar charts and time-space diagrams, network systems, Resource allocation and leveling.

CE 694 Construction Methods and Equipment

Work study, data processing and computational equipment, performance characteristics of equipment, concrete placing, material flow, equipment management.

CE 695 Construction Planning

Systems and models, management information system, construction planning with matrix and input-output models, optimization of production programme using linear programming models, dynamic programming, decision making.

CE 690 Labour Relations in the Construction Industry

Human relations in industry, people and productivity, development of organized labour in Canada, construction contractors, construction labour law, role and powers of labour unions and management, collective bargaining, construction management bargaining organizations, construction owner-clients

Books/Texts

- CE 691 - COOMBS/PALMER - CONST. ACCTG. & FINANCIAL MGMT. (McGraw Hill)
CE 692 - GOLDSMITH - CANADIAN BUILDING CONTRACTS (CARSWELL CO).
CE 693 - R. HARRIS, PRECEDENCE AND ARROW NETWORKING TECHNIQUES FOR CONSTRUCTION. (J. WILEY)
CE 694 - CAMPBELL, CONST. EQUIPMENT MANAGEMENT (CUPW).
CE 690 - P. ALLEN, MANUAL OF LABOUR RELATIONS WITH THE CONSTRUCTION TRADES. (CUPW, UNIV. OF WATERLOO)

Educational Programme Objectives:

TO TRAIN STUDENTS AND INDUSTRY PERSONNEL FOR THE CONSTRUCTION INDUSTRY OWNERS, CLIENTS, CONTRACTORS BY IMPARTING ADMINISTRATIVE SCIENCE/ARTS AND EXPERIENCE OF THE MORE SUCCESSFUL MANAGERS.
END AIM IS TO TRAIN PROJECT MANAGERS

Research (Please tick)

Organizational (Applied) (✓) Engineering (Hard) ()

Research Funding

(Indicate source & amount (US \$))

National Research Council.
\$ 20,000 annually.

Describe Nature/objectives
of Research

Productivity, Operations Research.

and

Research Facilities (if any)

No hard research facilities

Are there any special features of your programme. Please indicate.

A Co-op feature whereby the programme is split into two parts A & B.
Part A is offered twice in one calendar year Jan - April and again Sept - December.
Similarly Part B is offered the next calendar year twice.
Students can thus enroll on a co-op basis in two consecutive years during the winter months when (field) construction activity is at a low ebb and obtain their Masters. the intensifying period is spent on the project work.

February 17th, 1981.

Name of Institution Concordia University

Faculty/School Centre For Building Studies, Faculty Of Engineering & address Computer Science

Name, Title of Contact

Name, Title of Respondee Dr. Alan D. Russell

Programme/s offered

Degree Bachelor Master Ph.D. Non-Deg. Certificate Programme Other Specify

| Year Programme Established | Duration (years) - length of Programme | 1976 | | 1977 | |
|---|--|---|----------------------------|--------------------------|-----------|
| | | 1 for full-time students | 3-5 for part-time students | 1 for full-time students | 3-4 years |
| Enrollment | | | | | |
| Current Part Time | | | 35 | 5 | 0 |
| Current Full Time | | | | | 4 |
| Other (specify) of which | | | | | |
| National | | | | | |
| Foreign | | | | | |
| Admission Requirements | | B. Eng. or B. Arch. 13 courses 8 tech. report thesis or 8 courses plus thesis | | | |
| Course Requirements - list number of courses needed whether thesis or not | | M. Eng or equiv. (MBA) 6 courses & thesis | | | |
| Scholarship, Fellowship Bursaries, etc. available | | Concordia Fellowships- Prov. & Fed. Gov't Scholarships | | | |

| | |
|-------------------------------------|--|
| Language of Instruction | English |
| Total Numbers of Students Graduated | National 10 Foreign 5 |
| Indicate % of funding by | Government Industry Other (specify) |
| Staff Numbers: Totals (Indicate #s) | Faculty Full Time (3) Part Time (3) Industry, Instructors () Speakers () |
| Industry Input (Please tick) | Financial Administrative () Curriculum Development () Scholarship, Bursaries etc. () Overseas Body Industry Liaison (X) |

Comments

Course, Titles, Descriptions Indicate Text Title (if any)

Bldg M655 Building Engineering Systems
 Bldg M656 Building Economics I
 Bldg M657 Project Management
 Bldg M658 Decision Analysis
 Bldg M680 Construction Planning and Control I
 Bldg M681 Labor and Industrial Relations in Construction
 Bldg M682 Legal Issues in Construction
 Bldg M683 Construction Processes
 Bldg M684 Construction Planning and Control II
 Bldg M781 Project Acquisition and Control
 Bldg M783 Building Economics II
 Bldg M784 Computers and Management Information Systems in Construction
 Bldg M785 Human Factors in Construction
 Bldg M786 Business Practices for Construction Management
 Bldg M787 Construction Equipment Management
 Bldg M789 Selected Topics in Construction Management

NB: Prerequisites are not shown. Students are also encouraged to take selected courses from the MBT programme and Computer Science.

Educational Programme Objectives:

To provide a grounding in the fundamentals of project and construction management and to provide an opportunity for students to synthesize their knowledge through case studies, project work and thesis work.

Research (Please tick) Organizational (Applied) (X) Engineering (Bard) (X)
 Research Funding (Indicate source & amount (US \$)) National Science and Engineering Research Council (NSERC). Individual construction firms.
 Describe Nature/objectives of Research and Development of project management information systems for medium sized general contractors. Risk analysis. Modeling of construction operations and productivity improvement. Escalation management.
 Research Facilities (if any)

Are there any special features of your programme. Please indicate.

All courses offered in the evening to facilitate attendance by practicing professionals.

February 17th, 1981.

Study of Construction Programs

Name of Institution AUBURN UNIVERSITY

Faculty/School
address Auburn University
Auburn AL 36830 USA

Name, Title of Contact Dr. Lansford C. Bell

Name, Title of Respondent Associate Professor

Program/s offered Dept. of Civil Engg

Bachelor Master Ph.D Degree Non-deg. Part of Other
Certificate Programs SpecifyYear Program Established
Duration (years) - length
of Program

Enrollment

Current Part Time

Current Full Time

Other (specify)

of which

National

Foreign

Admission Requirements

Course Requirements - List

number of courses needed

whether thesis or not

Scholarship, Fellowship

Bursaries, etc. available

Language of Instruction English

Total Numbers of Students Graduated

Indicate % of funding by

Government

Industry

Other (specify)

State

Faculty Full Time (2) Part Time (1) Industry, Instructors ()

Financial Administrative () Curriculum Development ()

Scholarship, Bursaries etc. () Overseas Body Industry Liaison ()

Comments

Course, Titles, Descriptions
Indicate Text Title (if any)

CE 415 Construction Contracting

CE 660 Construction Applications of Operations Research I

CE 661 Construction Engineering Functions

CE 662 Construction Applications of Operations Research II

CE 663 Construction Engineering Methods

CE 664 Construction Systems Planning and Control

CE 665 Construction Engineering Analysis

Educational Programs Objectives:

To provide qualified students with an opportunity for advanced training and specialization and to enable those students to gain experience in conducting research and in the interpretation and communication of their findings.

Research (Please tick)

Organizational (Applied) () Engineering (Hard) (X)

Research Funding

(Indicate source & amount (US \$))

Auburn University Engineering Experiment Station (\$20,000) and others

Describe Nature/objectives

of Research

Application of statistics, computer simulation and principles of

operations research to construction operations, organizational

Research Facilities (if any) Structures and highway maintenance.

Are there any special features of your programme. Please indicate.

February 17th, 1981.

Study of Construction Programmes

Name of Institution Bowling Green State University

Faculty/School Construction/Design Unit
address School of Technology
Bowling Green, Ohio 43403

Name, Title of Contact Prof. William E. Brewer

Name, Title of Respondent

Programme/s offered

Degree Bachelor Master Ph.D Degree Non-deg. Non-deg. Part of Other
Certificate Programme Specif.

Year Programme Established
Duration (years) - length
of Programme

Enrollment

Current Part Time

Current Full Time

Other (specify)

of which

National

Foreign

Admission Requirements

Course Requirements - list
number of courses needed
whether thesis or not

Scholarship, Fellowship
Bursaries, etc. available

Language of Instruction

Total Numbers of Students Graduated

National Foreign

Administration Scholarship Research

Indicate % of funding by Government

Industry

Other (specify)

Faculty Full Time (3) Part Time (4) Industry, Instructors ()

Speakers ()

Financial Administrative () Curriculum Development ()

Scholarship, Bursaries etc. () Overseeing Body, Industry Liaison ()

Industry Input

(Please tick)

Comments

Course, Titles, Descriptions
Indicate Text Title (if any)

Strength of Materials
Land Planning and Development
Surveying Practice
Commercial and Industrial Construction
Construction Equipment
Light Building Construction
Civil Construction
Problems in Construction Technology
Construction Technology
Cooperative Internship-Basic
Architectural Graphics
Commercial and Industrial Construction
Cooperative Internship-Intermediate
Estimating and Cost Control
Construction Contracting
Design and Engineering Graphics 1
Materials Processing 1
Introduction to Technology - The Man Made World
Energy Power, Instrumentation and Control 1
Energy, Power, Instrumentation and Control 11

Educational Programme Objectives:

Graduate personnel with an understanding of "construction" who could be
gainfully employed by the industry.

Research (Please tick)

Organizational (Applied) () Engineering (Hard) ()

Research Funding
(Indicate source & amount (US \$))

Describe Nature/objectives
of Research

and

Research Facilities (if any)

Are there any special features of your programme. Please indicate.

Our program contains three, 12 week, coop sessions. This gives the student
to see the real world and what makes the industry function.

Introduction to Programming 1
Fortran Programming
College Physics
Basic Calculus 1
Basic Calculus 11
Calculus and Analytic Geometry 1
Calculus and Analytic Geometry 11
Principles of Organization and Management
Organizational Theory and Behavior
General Business Law
Varieties of Writing
Principles of Speech Communication
Technical Writing
Business Communications
Visual Communication Technology
Principles of Sociology
General Psychology

Study of Construction Programs

February 17th, 1961.

Name of Institution **BROADLEY UNIVERSITY**Faculty/School address **Peoria, IL 61625 U.S.A.**Name, Title of Contact **M. I. Guest, AIC, Professor and Department Chairman**Name, Title of Responder **M. I. Guest, AIC, Professor and Department Chairman**Program/s offered

| Degree | Degree | Non-deg. | Part of | Other |
|----------|--------|----------|---------|-------------|
| Bachelor | Master | Ph.D | Diploma | Certificate |
| Specify | | | | |

Year Programs Established **1968**Duration (years) - length of Programs **4**

Enrollment

Current Part Time **125**Current Full Time **120**

Other (specify) of which

National **120**Foreign **5**Admission Requirements **ACT Composite 20 (min) or SAT Total 950 (min); High School graduation upper one-half of class; high school physics and pre-calculus mathematics**

Course Requirements - list

number of courses needed **124 semester hours (minimum); no thesis**

whether thesis or not

Scholarship, Fellowship

Bursaries, etc. available **Few**Language of Instruction **English**

Total Numbers of Students Graduated

National **415**Foreign **10**

Indicate % of funding by

Government

Industry

Other (specify) Institution primarily concerned with undergraduate teaching; income primarily from student tuition.

Staff Numbers: Totals (Indicate #s)

Faculty Full Time (4) Part Time (3) Industry, Instructors (0) Speakers

Industry Input

(Please tick)

Financial Administrative (x) Curriculum Development (x)

Scholarship, Bursaries etc. (x) Overseeing Body Industry Liaison (x)

Comments

Course, Titles, Descriptions
Indicate Text Title (if any)
20% General Education
20% Mathematics/Science
15% Business Management
45% Construction: Introduction to Construction
100%

Construction Graphics
Mechanical and Electrical Equipment for Buildings
Advanced Environmental Technologies in Construction
Materials and Methods of Construction I, II
Construction Equipment and Methods
Construction Productivity
Construction Management
Construction Contracts
Construction Practice
Construction Estimating
Wood and Steel Structures
Concrete and Foundation Structures
Surveying
Soil Mechanics
Senior Seminar

Educational Programs Objectives:

To provide the basic (BS) professional degree for the Constructor. To this end the curriculum provides the balanced cultural, technical, managerial and professional foundation necessary for a career and for further individual development.

Research (Please tick) None Organizational (Applied) () Engineering (Hard) ()

Research Funding

(Indicate source & amount (US \$) None

Describe Nature/objectives

of Research None

and

Research Facilities (if any) Time-lapse and Computer

Are there any special features of your programme. Please indicate. Accredited by the American Council for Construction Education Member Associated Schools of Construction

February 17th, 1961.

Name of Institution Carnegie-Mellon University
Faculty/School Dept. of Civil Engineering
address Pittsburgh, PA. 15213
Name, Title of Contact Dr. Dwight A. Sangrey
Name, Title of Respondent Head, Dept. of Civil Engineering
Programs/s offered Degree Bachelor Master Ph.D Non-deg. Diploma Part of Other Certificate Programs Specify

Year Programs Established 1981
Duration (years) - length of Program one year *The name of the program is "Engineering Planning and Management" and the degree is M.S. in C.E.

Enrollment (estimated for Fall 1961)

Current Part Time 7

Estimated Full Time (MSI-52) 3

Other (specify) 4

of which National B.S. in C.E.

Foreign 8 courses

Admission Requirements number of courses needed plus thesis

Scholarship, Fellowship Yes

Bursaries, etc. available

| Language of Instruction | | English | |
|-------------------------------------|--|---|---|
| Total Numbers of Students Graduated | | National | Foreign |
| Indicate % of funding by | | Administration | Administration |
| Government | | 100% | 100% |
| Industry | | 0 | 0% |
| Other (specify) | | 100% university | 100% university |
| Faculty Full Time (4) Part Time () | | Industry, Instructors | Industry, Instructors |
| Staff Numbers: Totals (Indicate #s) | | Speakers | Speakers |
| Industry Input (Please tick) | | Financial Administrative () Curriculum Development () | Financial Administrative () Curriculum Development () |
| | | Scholarship, Bursaries etc. () | Scholarship, Bursaries etc. () |

Comments *The faculty members also teach undergraduate courses which are not a part of this graduate program.

Course, Titles, Descriptions
Indicate Text Title (if any)
Description of core courses for the program is attached.

Educational Program Objectives:
Preparation of Civil engineers who are interested in one of the two areas:
1. Transportation system planning
2. Management of constructed facilities

Research (Please tick) Organizational (Applied) (V) Engineering (Hard) ()
Research Funding \$200,000 (U.S. DOT, Pennsylvania DOT)
(Indicate source & amount (US \$))

Describe Nature/objectives of Research and Research Facilities (if any)
1. Peak-hour travel demand analysis
2. Traffic management during the reconstruction of a major arterial highway.

Are there any special features of your programme. Please indicate.

CORE COURSES FOR ENGINEERING PLANNING AND MANAGEMENT PROGRAM

12-701 Analysis of Network-Based Systems (Fall)

Introduction to topological and algebraic properties of networks; analysis of networks governed by potential relations, flow relations or constitutive equations; applications to network-based systems such as surveying networks, CPM-PERT networks, traffic networks, hydraulic networks and structural networks; treatment of data and information structures.

12-702 Methods of Computer-Aided Design (Spring)

Focuses on the design and implementation of programs for analysis and synthesis in architecture and civil engineering. Both batch and interactive programs are considered. Topics covered include: data structures, the design of large data bases, graphic display techniques, formal and problem-oriented languages, decision tables and other methods of program organization.

12-703 Demand Analysis and Forecasting (Fall)

Formulation and measurement of demand as a function of causal variables (such as prices, socio-economic conditions, etc.); discussion of the principal techniques for forecasting the usage of engineering systems and facilities.

12-704 Reliability and Risk Analysis (Spring)

Methods for assuring a high degree of safety and reliability in the design and operation of engineering projects: codes, inspection, quality assurance and quality control procedures, redundancy and fail-safe design. Practical measures of risk and reliability levels with applications to particular projects. Differences in philosophy and measurement techniques.

12-705 Project Management and Financing (Fall)

Studies of the planning, scheduling and evaluation of large scale capital projects; construction safety and productivity; human factors in project management. Operational and financial risks of projects to an organization; cost estimates and controls; effects of inflation. Impact of large scale projects to local environments.

12-706 Public Investment Planning and Pricing (Spring)

Economic framework for identifying and analyzing investment and operating options facing both public agencies and private firms; economic efficiency, utilization, pricing and investment (both in theory and in practice); multi-objective evaluation.

Study of Construction Programs

Name of Institution CASE WESTERN RESERVE UNIVERSITY
 Faculty/School DEPARTMENT OF CIVIL ENGINEERING
 Address CASE INSTITUTE OF TECHNOLOGY, CLEVELAND, OHIO 44106, U.S.A.

Name, Title of Contact GEORGE S. BIRSELL
 Name, Title of Respondent Associate Professor

Program/s offered Degree Bachelor Degree Master Ph.D. Non-
 Page 2
 Specify

| Year Programs Established | 1979 | 1980 | 1981 | 1982 | 1983 | 1984 | 1985 | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | 2032 | 2033 | 2034 | 2035 | 2036 | 2037 | 2038 | 2039 | 2040 | 2041 | 2042 | 2043 | 2044 | 2045 | 2046 | 2047 | 2048 | 2049 | 2050 | 2051 | 2052 | 2053 | 2054 | 2055 | 2056 | 2057 | 2058 | 2059 | 2060 | 2061 | 2062 | 2063 | 2064 | 2065 | 2066 | 2067 | 2068 | 2069 | 2070 | 2071 | 2072 | 2073 | 2074 | 2075 | 2076 | 2077 | 2078 | 2079 | 2080 | 2081 | 2082 | 2083 | 2084 | 2085 | 2086 | 2087 | 2088 | 2089 | 2090 | 2091 | 2092 | 2093 | 2094 | 2095 | 2096 | 2097 | 2098 | 2099 | 2100 | 2101 | 2102 | 2103 | 2104 | 2105 | 2106 | 2107 | 2108 | 2109 | 2110 | 2111 | 2112 | 2113 | 2114 | 2115 | 2116 | 2117 | 2118 | 2119 | 2120 | 2121 | 2122 | 2123 | 2124 | 2125 | 2126 | 2127 | 2128 | 2129 | 2130 | 2131 | 2132 | 2133 | 2134 | 2135 | 2136 | 2137 | 2138 | 2139 | 2140 | 2141 | 2142 | 2143 | 2144 | 2145 | 2146 | 2147 | 2148 | 2149 | 2150 | 2151 | 2152 | 2153 | 2154 | 2155 | 2156 | 2157 | 2158 | 2159 | 2160 | 2161 | 2162 | 2163 | 2164 | 2165 | 2166 | 2167 | 2168 | 2169 | 2170 | 2171 | 2172 | 2173 | 2174 | 2175 | 2176 | 2177 | 2178 | 2179 | 2180 | 2181 | 2182 | 2183 | 2184 | 2185 | 2186 | 2187 | 2188 | 2189 | 2190 | 2191 | 2192 | 2193 | 2194 | 2195 | 2196 | 2197 | 2198 | 2199 | 2200 | 2201 | 2202 | 2203 | 2204 | 2205 | 2206 | 2207 | 2208 | 2209 | 2210 | 2211 | 2212 | 2213 | 2214 | 2215 | 2216 | 2217 | 2218 | 2219 | 2220 | 2221 | 2222 | 2223 | 2224 | 2225 | 2226 | 2227 | 2228 | 2229 | 2230 | 2231 | 2232 | 2233 | 2234 | 2235 | 2236 | 2237 | 2238 | 2239 | 2240 | 2241 | 2242 | 2243 | 2244 | 2245 | 2246 | 2247 | 2248 | 2249 | 2250 | 2251 | 2252 | 2253 | 2254 | 2255 | 2256 | 2257 | 2258 | 2259 | 2260 | 2261 | 2262 | 2263 | 2264 | 2265 | 2266 | 2267 | 2268 | 2269 | 2270 | 2271 | 2272 | 2273 | 2274 | 2275 | 2276 | 2277 | 2278 | 2279 | 2280 | 2281 | 2282 | 2283 | 2284 | 2285 | 2286 | 2287 | 2288 | 2289 | 2290 | 2291 | 2292 | 2293 | 2294 | 2295 | 2296 | 2297 | 2298 | 2299 | 2300 | 2301 | 2302 | 2303 | 2304 | 2305 | 2306 | 2307 | 2308 | 2309 | 2310 | 2311 | 2312 | 2313 | 2314 | 2315 | 2316 | 2317 | 2318 | 2319 | 2320 | 2321 | 2322 | 2323 | 2324 | 2325 | 2326 | 2327 | 2328 | 2329 | 2330 | 2331 | 2332 | 2333 | 2334 | 2335 | 2336 | 2337 | 2338 | 2339 | 2340 | 2341 | 2342 | 2343 | 2344 | 2345 | 2346 | 2347 | 2348 | 2349 | 2350 | 2351 | 2352 | 2353 | 2354 | 2355 | 2356 | 2357 | 2358 | 2359 | 2360 | 2361 | 2362 | 2363 | 2364 | 2365 | 2366 | 2367 | 2368 | 2369 | 2370 | 2371 | 2372 | 2373 | 2374 | 2375 | 2376 | 2377 | 2378 | 2379 | 2380 | 2381 | 2382 | 2383 | 2384 | 2385 | 2386 | 2387 | 2388 | 2389 | 2390 | 2391 | 2392 | 2393 | 2394 | 2395 | 2396 | 2397 | 2398 | 2399 | 2400 | 2401 | 2402 | 2403 | 2404 | 2405 | 2406 | 2407 | 2408 | 2409 | 2410 | 2411 | 2412 | 2413 | 2414 | 2415 | 2416 | 2417 | 2418 | 2419 | 2420 | 2421 | 2422 | 2423 | 2424 | 2425 | 2426 | 2427 | 2428 | 2429 | 2430 | 2431 | 2432 | 2433 | 2434 | 2435 | 2436 | 2437 | 2438 | 2439 | 2440 | 2441 | 2442 | 2443 | 2444 | 2445 | 2446 | 2447 | 2448 | 2449 | 2450 | 2451 | 2452 | 2453 | 2454 | 2455 | 2456 | 2457 | 2458 | 2459 | 2460 | 2461 | 2462 | 2463 | 2464 | 2465 | 2466 | 2467 | 2468 | 2469 | 2470 | 2471 | 2472 | 2473 | 2474 | 2475 | 2476 | 2477 | 2478 | 2479 | 2480 | 2481 | 2482 | 2483 | 2484 | 2485 | 2486 | 2487 | 2488 | 2489 | 2490 | 2491 | 2492 | 2493 | 2494 | 2495 | 2496 | 2497 | 2498 | 2499 | 2500 | 2501 | 2502 | 2503 | 2504 | 2505 | 2506 | 2507 | 2508 | 2509 | 2510 | 2511 | 2512 | 2513 | 2514 | 2515 | 2516 | 2517 | 2518 | 2519 | 2520 | 2521 | 2522 | 2523 | 2524 | 2525 | 2526 | 2527 | 2528 | 2529 | 2530 | 2531 | 2532 | 2533 | 2534 | 2535 | 2536 | 2537 | 2538 | 2539 | 2540 | 2541 | 2542 | 2543 | 2544 | 2545 | 2546 | 2547 | 2548 | 2549 | 2550 | 2551 | 2552 | 2553 | 2554 | 2555 | 2556 | 2557 | 2558 | 2559 | 2560 | 2561 | 2562 | 2563 | 2564 | 2565 | 2566 | 2567 | 2568 | 2569 | 2570 | 2571 | 2572 | 2573 | 2574 | 2575 | 2576 | 2577 | 2578 | 2579 | 2580 | 2581 | 2582 | 2583 | 2584 | 2585 | 2586 | 2587 | 2588 | 2589 | 2590 | 2591 | 2592 | 2593 | 2594 | 2595 | 2596 | 2597 | 2598 | 2599 | 2600 | 2601 | 2602 | 2603 | 2604 | 2605 | 2606 | 2607 | 2608 | 2609 | 2610 | 2611 | 2612 | 2613 | 2614 | 2615 | 2616 | 2617 | 2618 | 2619 | 2620 | 2621 | 2622 | 2623 | 2624 | 2625 | 2626 | 2627 | 2628 | 2629 | 2630 | 2631 | 2632 | 2633 | 2634 | 2635 | 2636 | 2637 | 2638 | 2639 | 2640 | 2641 | 2642 | 2643 | 2644 | 2645 | 2646 | 2647 | 2648 | 2649 | 2650 | 2651 | 2652 | 2653 | 2654 | 2655 | 2656 | 2657 | 2658 | 2659 | 2660 | 2661 | 2662 | 2663 | 2664 | 2665 | 2666 | 2667 | 2668 | 2669 | 2670 | 2671 | 2672 | 2673 | 2674 | 2675 | 2676 | 2677 | 2678 | 2679 | 2680 | 2681 | 2682 | 2683 | 2684 | 2685 | 2686 | 2687 | 2688 | 2689 | 2690 | 2691 | 2692 | 2693 | 2694 | 2695 | 2696 | 2697 | 2698 | 2699 | 2700 | 2701 | 2702 | 2703 | 2704 | 2705 | 2706 | 2707 | 2708 | 2709 | 2710 | 2711 | 2712 | 2713 | 2714 | 2715 | 2716 | 2717 | 2718 | 2719 | 2720 | 2721 | 2722 | 2723 | 2724 | 2725 | 2726 | 2727 | 2728 | 2729 | 2730 | 2731 | 2732 | 2733 | 2734 | 2735 | 2736 | 2737 | 2738 | 2739 | 2740 | 2741 | 2742 | 2743 | 2744 | 2745 | 2746 | 2747 | 2748 | 2749 | 2750 | 2751 | 2752 | 2753 | 2754 | 2755 | 2756 | 2757 | 2758 | 2759 | 2760 | 2761 | 2762 | 2763 | 2764 | 2765 | 2766 | 2767 | 2768 | 2769 | 2770 | 2771 | 2772 | 2773 | 2774 | 2775 | 2776 | 2777 | 2778 | 2779 | 2780 | 2781 | 2782 | 2783 | 2784 | 2785 | 2786 | 2787 | 2788 | 2789 | 2790 | 2791 | 2792 | 2793 | 2794 | 2795 | 2796 | 2797 | 2798 | 2799 | 2800 | 2801 | 2802 | 2803 | 2804 | 2805 | 2806 | 2807 | 2808 | 2809 | 2810 | 2811 | 2812 | 2813 | 2814 | 2815 | 2816 | 2817 | 2818 | 2819 | 2820 | 2821 | 2822 | 2823 | 2824 | 2825 | 2826 | 2827 | 2828 | 2829 | 2830 | 2831 | 2832 | 2833 | 2834 | 2835 | 2836 | 2837 | 2838 | 2839 | 2840 | 2841 | 2842 | 2843 | 2844 | 2845 | 2846 | 2847 | 2848 | 2849 | 2850 | 2851 | 2852 | 2853 | 2854 | 2855 | 2856 | 2857 | 2858 | 2859 | 2860 | 2861 | 2862 | 2863 | 2864 | 2865 | 2866 | 2867 | 2868 | 2869 | 2870 | 2871 | 2872 | 2873 | 2874 | 2875 | 2876 | 2877 | 2878 | 2879 | 2880 | 2881 | 2882 | 2883 | 2884 | 2885 | 2886 | 2887 | 2888 | 2889 | 2890 | 2891 | 2892 | 2893 | 2894 | 2895 | 2896 | 2897 | 2898 | 2899 | 2900 | 2901 | 2902 | 2903 | 2904 | 2905 | 2906 | 2907 | 2908 | 2909 | 2910 | 2911 | 2912 | 2913 | 2914 | 2915 | 2916 | 2917 | 2918 | 2919 | 2920 | 2921 | 2922 | 2923 | 2924 | 2925 | 2926 | 2927 | 2928 | 2929 | 2930 | 2931 | 2932 | 2933 | 2934 | 2935 | 2936 | 2937 | 2938 | 2939 | 2940 | 2941 | 2942 | 2943 | 2944 | 2945 | 2946 | 2947 | 2948 | 2949 | 2950 | 2951 | 2952 | 2953 | 2954 | 2955 | 2956 | 2957 | 2958 | 2959 | 2960 | 2961 | 2962 | 2963 | 2964 | 2965 | 2966 | 2967 | 2968 | 2969 | 2970 | 2971 | 2972 | 2973 | 2974 | 2975 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| 3119 | 3120 | 3121 | 3122 | 3123 | 3124 | 3125 | 3126 | 3127 | 3128 | 3129 | 3130 | 3131 | 3132 | 3133 | 3134 | 3135 | 3136 | 3137 | 3138 | 3139 | 3140 | 3141 | 3142 | 3143 | 3144 | 3145 | 3146 | 3147 | 3148 | 3149 | 3150 | 3151 | 3152 | 3153 | 3154 | 3155 | 3156 | 3157 | 3158 | 3159 | 3160 | 3161 | 3162 | 3163 | 3164 | 3165 | 3166 | 3167 | 3168 | 3169 | 3170 | 3171 | 3172 | 3173 | 3174 | 3175 | 3176 | 3177 | 3178 | 3179 | 3180 | 3181 | 3182 | 3183 | 3184 | 3185 | 3186 | 3187 | 3188 | 3189 | 3190 | 3191 | 3192 | 3193 | 3194 | 3195 | 3196 | 3197 | 3198 | 3199 | 3200 | 3201 | 3202 | 3203 | 3204 | 3205 | 3206 | 3207 | 3208 | 3209 | 3210 | 3211 | 3212 | 3213 | 3214 | 3215 | 3216 | 3217 | 3218 | 3219 | 3220 | 3221 | 3222 | 3223 | 3224 | 3225 | 3226 | 3227 | 3228 | 3229 | 3230 | 3231 | 3232 | 3233 | 3234 | 3235 | 3236 | 3237 | 3238 | 3239 | 3240 | 3241 | 3242 | 3243 | 3244 | 3245 | 3246 | 3247 | 3248 | 3249 | 3250 | 3251 | 3252 | 3253 | 3254 | 3255 | 3256 | 3257 | 3258 | 3259 | 3260 | 3261 | 3262 | 3263 | 3264 | 3265 | 3266 | 3267 | 3268 | 3269 | 3270 | 3271 | 3272 | 3273 | 3274 | 3275 | 3276 | 3277 | 3278 | 3279 | 3280 | 3281 | 3282 | 3283 | 3284 | 3285 | 3286 | 3287 | 3288 | 3289 | 3290 | 3291 | 3292 | 3293 | 3294 | 3295 | 3296 | 3297 | 3298 | 3299 | 3300 | 3301 | 3302 | 3303 | 3304 | 3305 | 3306 | 3307 | 3308 | 3309 | 3310 |
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February 17th, 1981.

618 - MS
Study of Construction Programmes

Name of Institution **Clemson University**
Faculty/School **Department of Civil Engineering**
address

Name, Title of Contact **Dr. Herbert W. Rusching, Professor and Head**
Name, Title of Responder

Programme/s offered
Degree Bachelor Degree Master Ph.D Non-deg. Part of Other
Certificate Programme Specify

Year Programme Established 1900 1958 1958 NA NA NA
Duration (years) - length (4 yrs) (1-1/2 (3 yrs) yrs)

Enrollment

Current Part Time

Current Full Time

Other (specify)
of which

National
Foreign

Admission Requirements

Adm Office
establishes

B avg. B avg.

Course Requirements - list 138 sem 30 sem Usually
number of courses needed cr hrs cr hrs 45-48+
whether thesis or not 18 hrs dissertation

Scholarship, Fellowship Yes Yes - graduate stipends of at least
Bursaries, etc. available \$400/mo are available

Language of Instruction English

Total Numbers of Students Graduated BSCCE 2, 025, MS 120, PhD 7

Indicate % of funding by Government National 75 Foreign 25 in grad programs

Industry 100 Administration Scholarship Research 85

Other (specify) 50 50(individuals) - 15

Staff Numbers: Totals Faculty Full Time (18) Part Time (-) Industry, Instructors (-) Speakers

Industry Input Financial Administrative (x) Curriculum Development (x)

(Please tick) Scholarship, Bursaries etc. (x) Overseas Body Industry Liaison (x)

Comments

Course, Titles, Descriptions
Indicate Text Title (if any)

Note BSCE degree program attached and list of all CE courses

Educational Programme Objectives:

See attached page

Research (Please tick)

Organizational (Applied) () Engineering (Hard) ()

Research Funding

(Indicate source & amount (US \$) see attached page

Describe Nature/objectives Research directed to applied and basic engineering.
of Research Facilities include structural testing laboratory (including
and 1,000,000 lb capacity compression machine) and a hydraulics
Research Facilities (if any) laboratory for physical hydraulic modelling.

Are there any special features of your programme. Please indicate.

Four specialty areas are defined in graduate level programs - construction,
transportation, structural engineering, water resources.

CLEMSON, UNIVERSITY

List of Courses in Civil Engineering

| | | |
|--------------|--|------------|
| CE 201 | Surveying | 3(2,3) |
| CE 205 | Civil Engineering Computer Applications | 3(2,2) |
| CE 301 | Structural Analysis I | 3(2,2) |
| CE 302 | Structural Steel Design | 3(2,2) |
| CE 310 | Transportation Engineering | 4(3,2) |
| CE 320 | Introduction to Construction Materials | 3(2,3) |
| CE 330 | Soil Mechanics | 3(2,2) |
| CE 402 | Reinforced Concrete Design | 3(2,2) |
| CE 403/603 | Use of Computers in Structural Analysis & Design | 3(2,2) |
| CE 404/604 | Masonry Structural Design | 3(3,0) |
| CE 410/610 | Traffic Engineering: Operations | 3(3,0) |
| CE 412/612 | Urban Transportation Planning | 3(3,0) |
| CE 417/617 | Airphoto Interpretation | 3(2,3) |
| CE 419/619 | General Photogrammetry | 3(2,3) |
| CE 421/621 | Hydrology | 3(3,0) |
| CE 424 | Introduction to Construction Engineering | 3(3,0) |
| CE 425 | Engineering Relations | 3(3,0) |
| CE 431/631 | Applied Soil Mechanics | 3(2,2) |
| CE 432/632 | Construction Project Administration | 3(2,2) |
| CE 433/633 | Construction Planning & Scheduling | 3(2,3) |
| CE 434/634 | Construction Estimating and Project Control | 3(2,3) |
| CE 435/635 | Engineering Project Analysis | 3(2,2) |
| CE 436/636 | Construction Support Operations | 3(2,3) |
| CE 439/639 | Construction Equipment Selection and Maintenance | 3(2,3) |
| CE 441/641 | Applied Hydraulics | 3(3,0) |
| CE 453/653 | Advanced Structural Analysis | 3(3,0) |
| CE 462/662 | Coastal Engineering I | 3(3,0) |
| CE 463/663 | Coastal Engineering II | 3(3,0) |
| CE 464/664 | Physical Models in Fluid Mechanics | 3(2,2) |
| CE 470/670 | Probabilistic Design in Civil Engineering | 3(3,0) |
| CE 490, 4490 | Special Projects | 1-3(1-3,0) |
| CE 499 | Civil Engineering Design Project | 3(2,3) |
| CE 801 | Matrix Methods of Structural Analysis | 3(3,0) |
| CE 802 | Prestressed Concrete Analysis and Design | 3(3,0) |
| CE 803 | Reinforced Concrete Structural Systems | 3(3,0) |
| CE 804 | Theory and Design of Thin Plates | 3(3,0) |
| CE 805 | Plastic Analysis and Design of Steel Structures | 3(3,0) |
| CE 806 | Metal Compression Members | 3(3,0) |
| CE 807 | Numerical and Approximate Methods of Structural Analysis | 3(3,0) |
| CE 808 | Finite Element Method in Engineering | 3(3,0) |
| CE 811 | Highway Geometric Design | 3(2,3) |
| CE 812 | Airphoto Interpretation II | 3(2,3) |
| CE 813 | Highway and Airport Pavement Design | 3(3,0) |

Educational Programme Objectives:

The primary objective of the program is to prepare students for successful professional careers in civil engineering. Preparation for these careers is accomplished through the organized program of formal instruction in the courses noted in this questionnaire. In addition, student backgrounds are enhanced by contact with faculty and practicing engineers, by involvement in student chapter professional society activities, field trips, outside lecturers, and contact with research projects, and a variety of extracurricular activities.

Graduates are encouraged to become registered engineers and to continue their education throughout their professional careers.

Continued-

| | | |
|--------|---|--------|
| CE 814 | Traffic Flow Theory | 3(3.0) |
| CE 815 | Transportation Safety Engineering | 3(3.0) |
| CE 816 | Highway Planning | 3(3.0) |
| CE 817 | Mass Transit Planning | 3(3.0) |
| CE 818 | Airport Planning and Design | 3(3.0) |
| CE 819 | Transportation Research 2-4 | |
| CE 822 | Aggregates as Construction Materials | 3(2.3) |
| CE 830 | Advanced Soil Mechanics | 3(3.0) |
| CE 831 | Foundation Engineering | 3(3.0) |
| CE 835 | Construction Project Modeling and Control | 3(2.3) |
| CE 837 | Construction Specifications and Contracts | 3(2.3) |
| CE 840 | Construction of Nuclear Power Plants | 3(2.3) |
| CE 846 | Flow in Open Channels | 3(3.0) |
| CE 861 | Mechanics of Sediment Transport | 3(2.2) |
| CE 862 | Heat Transfer at Water Surfaces | 3(3.0) |
| CE 865 | Hydrology I | 3(3.0) |
| CE 866 | Hydrology II | 3(3.0) |
| CE 871 | Coastal Hydrodynamics | 3(3.0) |
| CE 872 | Marine Pollution Control | 2(2.0) |
| CE 889 | Special Problems I 1-3 | |
| CE 890 | Special Problems II 1-3 | |
| CE 891 | Master's Research. Credit to be arranged | 3(3.0) |
| CE 901 | Theory and Design of Shell Structures | 3(3.0) |
| CE 902 | Dynamic Analysis of Structures | |
| CE 991 | Doctoral Research. Credit to be arranged | |

February 17th, 1981.

CLJ - W63
Study of Construction Programmes

Name of Institution Ferris State College
Faculty/School address Construction Department
Name, Title of Contact James B. Shane, AIA
Name, Title of Responder Head - Construction Department
Programme/s offered Degree Degree Non-deg. Part of
 Bachelor Master Ph.D Diploma Certificate Programme Special

Year Programme Established 1981*
Duration (years) - length 4
of Programme

Enrollment

Current Part Time
Current Full Time
Other (specify)
of which

National
Foreign

Admission Requirements

Course Requirements - list
number of courses needed
whether thesis or not
Scholarship, Fellowship
Bursaries, etc. available

Language of Instruction English
Total Numbers of Students Graduated National Foreign
 Administration Scholarship Research
Indicate % of funding by Government Industry Other(specify)
 Faculty Full Time () Part Time () Industry,Instructors ()
 (Indicate \$'s) Speakers
Industry Input Financial Administrative () Curriculum Development ()
(Please tick) Scholarship,Bursaries etc.() Overseeing Body Industry Liaison ()

Comments

Course, Titles, Descriptions
Indicate Text Title (if any)

* Baccalaureate degree program in Construction Management to be
initiated Fall Term 1981/82 (September, 1981).

Educational Programme Objectives:

Research (Please tick) Organizational (Applic.) () Engineering (Hard) ()
Research Funding Research not currently anticipated
(Indicate source & amount (US \$))
Describe Nature/objectives and
of Research Research Facilities (if any) None

Are there any special features of your programme. Please indicate.

CIS - W65
Study of Construction Programs

February 17th, 1981.

Name of Institution GEORGIA INSTITUTE OF TECHNOLOGY

Faculty/School SCHOOL OF CIVIL ENGINEERING
address ATLANTA, GEORGIA, USA 30332

Name, Title of Contact DANIEL U. HALPIN, Professor of Civil Engineering
Name, Title of Respondee DANIEL U. HALPIN, Professor of Civil Engineering

Programs/s offered Degree Master Ph.D Diploma Certificate Programs Specify
Bachelor Master Ph.D Diploma Certificate Programs Specify

Year Programs Established N/A 1968 1973 N/A N/A
Duration (years) - length of Program 1 yr 3 yr (average)

Enrollment 27 3

Current Part Time 2 0

Current Full Time 25 3

Other (specify) of which

National 12 1

Foreign 13 2

Admission Requirements Undergraduate degree in Engineering or related Technical Area

Course Requirements - list 50 quarter hours are required for the MS degree of which
number of courses needed 6 hours minimum relate to a research topic. (Thesis optional)
whether thesis or not 50 hours beyond MS level to PhD plus Thesis

Scholarship, Fellowship Assistantships available - Applications required in Febru-
bursaries, etc. available ary of each year.

Language of Instruction English

Total Numbers of Students Graduated National 70 Foreign 30 (Approx. since 1973)

Indicate % of funding by Government Administration Scholarship Research

Industry 100 80 80

Other(specify) Grants 20 20

Staff Numbers: Totals Faculty Full Time (2) Part Time (2) Industry, Instructors (3)
(Indicate #'s) Speakers

Industry: Input Financial Administrative () Curriculum Development ()
(Please tick) Scholarship, Bursaries etc. () Overseas Body Industry Liaison ()

Comments

*Industry Speakers involved in Seminar Course.

Course, Titles, Descriptions
Indicate Text Title (if any)

Construction Management - Text: Halpin and Woodhead-Construction Management
Design of Construction - Halpin and Woodhead-Design of Constructi
Operations and Process Operations
Construction Administration Barrie and Paulson - Professional Constr
tion Management

C. E. Management I Harris - Precedence and Arrow Networking
C. E. Management II Readings in Cost Engineering - ASCE
Construction Law

Construction Seminar

Special Topics

Computer Applications in Construction

Experimental Statistics

Operations Research Hines and Montgomery - Probability
Construction Economics and Statistics in Engineering
Dacellenbach and George - Intro to OR

Educational Programs Objectives:

Graduate Education of Construction Managers

Research (Please tick) Organizational (Applied) (X) Engineering (Hard) ()
Microcomputer Analysis of Construction Operations

Research Funding (Indicate source & amount (US \$) U. S. Navy - \$40,000

Describe Nature/objectives of Research Investigate the Use of Microcomputers for Construction
Management Planning and Control

Research Facilities (if any) Several small Microcomputers
At Higher Level a DEC VAX midi- computer

Are there any special features of your programme. Please indicate.

Program relies heavily on Professional Problems or Term Projects carried
out by students in contact with the local Construction and Contracting Community.
Atlanta has a wide range of projects and construction related firms who are very
cooperative in supporting our program. Emphasis is on actual field construction
and site situations.

February 11th, 1981.

Study of Construction Programmes

Name of Institution Jackson State University

Faculty/School School of Industrial and Technical Studies

Name, Title of Contact Joe King, Head, Industrial Technology Department

Name, Title of Respondent Joe King, Head, Industrial Technology Department

Programme/s offered Degree Degree Non-dog. Non-deg. Part of Other
Bachelor Master Ph.D Diploma Certificate Programme Specific

Year Programme Established 1973
Duration (years) - length 8 years
of Programme

Enrollment

Current Part Time 5

Current Full Time 26

Other (specify)

of which

National 21

Foreign 10

Admission Requirements

High School ACT or SAT

Course Requirements - list

number of courses needed 10

whether thesis or not

Scholarship, Fellowship

Bursaries, etc. available

University scholarship

Language of Instruction

Total Numbers of Students Graduated

National 21

Foreign 8

Indicate % of funding by

Government

Industry

Other (specify)

Faculty Full Time (2) Part Time () Industry, Instructors (3)

Speakers

Financial Administrative () Curriculum Development (x)

Scholarship, Bursaries etc. () Overseeing Body Industry Liaison ()

(Please tick)

Comments

Course, Titles, Descriptions
Indicate Text Title (if any)

1. ITC 205 (3) Materials, Construction Procedures, and Practices. A study of the materials, building codes, techniques and procedures employed in building construction.
2. ITC 300 Mechanical and Electrical Equipment. Prerequisite: Consent of instructor. The basic principles and design of air conditioning, plumbing, electrical systems and equipment used in building.
3. ITC 305 Introduction to Plumbing. A course designed to acquaint the student with the fundamentals of basic residential and commercial plumbing.
4. ITC 317 Estimating and Scheduling. Prerequisite ITC 205. The methods of preparing labor and material quantity estimates.
5. ITC 319 Structural Design. Prerequisite ITC 404. Structural design procedures with reinforced concrete and steel.
6. ITC 324 Site Planning and Development. Prerequisite: Consent of instructor. The influence of climate, geography, topography, and geology on the design of a building site and the different uses of the transit in squaring up forms.
7. ITC 404 Strength of Materials. Prerequisite ITC 205. Problems related to the strength of the different types of building materials will be experienced by the student.
8. ITC 414 Contracts, Specifications, and Law. Prerequisite ITC 205. The preparation of specifications and conditions which forms the contractual relationship between owner and builder.
9. ITC 499 Building Seminar. Prerequisite Consent of instructor. Emphasis will be placed on problem solving as it relates to the different areas where students have found problems.

Educational Programme Objectives:

1. To develop an understanding of procedures and techniques used by tradesmen.
2. To develop ability and skill in a wide variety of construction operations.
3. To provide knowledge in areas related to construction.

Research (Please tick) Organizational (Applied) () Engineering (Hard) ()

Research Funding
(Indicate source & amount (US \$))

Describe Nature/objectives
of Research

and

Research Facilities (if any)

Are there any special features of your programme. Please indicate.

February 17th, 1981.

Name of Institution Massachusetts Institute of Technology

Faculty/School Dept. of Civil Engineering, 77 Mass. Ave., Room 1-253, Camb., MA 02139

Name, Title of Contact Robert D. Locher, Professor of Civil Engineering

Name, Title of Respondent

| Programme/s offered | Degree Bachelor | Degree Master | Degree Ph.D | Non-deg. Diploma | Non-deg. Certificate | Part of Programme | Other |
|--|-----------------|---------------|-------------|------------------|----------------------|-------------------|-------|
| Year Programme Established | 1978 | 1972 | 1977 | | | | |
| Duration (years) - length of Programme | 4 | 1 | 3 | | | | |

| Enrollment | 1978 | 1972 | 1977 |
|-------------------|------|------|------|
| Current Part Time | 12 | 22 | 6 |
| Current Full Time | | | |
| Other (specify) | | | |
| of which | | | |
| National | 9 | 12 | 1 |
| Foreign | 3 | 10 | 5 |

| Admission Requirements | Prior Degree, Analytic Background, C.E. preferred |
|---|---|
| Course Requirements - list number of courses needed whether thesis or not | 36 8 17 |
| Scholarship, Fellowship Bursaries, etc.-available | No Th. Th. Yes Yes |

| Language of Instruction | English |
|-------------------------------------|------------------------|
| Total Numbers of Students Graduated | National 60 Foreign 28 |

| Indicate % of funding by | Government | Industry | Other (specify) |
|--|------------|----------|-----------------|
| Faculty Full Time (3) Part Time (3) Industry, Instructors () Speakers () | 0 | 10% | 0 |
| Staff Numbers: Totals (Indicate %'s) | 0 | 100% | 80% |

| Industry Input (Please tick) | Financial Administrative () Curriculum Development () Scholarship, Bursaries etc. () Overseeing Body Industry Liaison () |
|--|--|
| Are there any special features of your programme. Please indicate. | |
| Research is strongly risk analysis based. | |

| Research Funding (Indicate source & amount (US \$)) | U.S. Department of Transportation The Business Roundtable U.S. State Department Agency for Int. Dev. |
|---|--|
| \$165,000 | |

| Describe Nature/objectives of Research and | Varied |
|--|--------|
| Research Facilities (if any) | |
| Variety of computer facilities, timelapse photographic equipment | |

| Are there any special features of your programme. Please indicate. | Research is strongly risk analysis based. |
|--|---|
| | |

| Research (Please tick) | Organizational (Applied) (X) Engineering (Hard) (X) |
|------------------------|---|
| | |

| Educational Programme Objectives: aspects of the construction industry and working knowledge of methodological tools applicable to decision-making in this industry. | Provide graduates with a sound understanding of all aspects of the construction industry and working knowledge of methodological tools applicable to decision-making in this industry. |
|--|--|
| | |

| Course, Titles, Descriptions Indicate Text Title (if any) | 1.40 Project Management |
|---|-------------------------|
| 1.411J Basic Building Construction | |
| 1.412J Design of Building Systems | |
| 1.413 The Construction of Buildings | |
| 1.431 Project Company Organizations | |
| 1.432 Project Control | |
| 1.441 Modeling of Construction Processes | |
| 1.442 Modeling of Project Management Decisions | |
| 1.451 Construction Labor Economics and Labor Relations | |
| 1.46 Analysis in Real Estate Development | |
| 1.471J Legal Problems in Construction | |
| 1.481 Seminar in Construction Engineering and Management | |
| 1.482 Engineering Risk-Benefit Analysis | |

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February 17th, 1981.

Study of Construction Programmes

Name of Institution **MEMPHIS STATE UNIVERSITY**
 Faculty/School **DEPARTMENT OF ENGINEERING TECHNOLOGY, MEMPHIS, TN 38152**
 Address

Name, Title of Contact

Name, Title of Respondent

CHAIRMAN

Programme/s offered

Degree Bachelor Master Ph.D

Non-deg. Certificate

Part of Programme Specifi.

Year Programme Established 1968

Duration (years) - length of Programme 4

Enrollment

Current Part Time 12

Current Full Time 60

Other (specify) of which

National 2

Foreign 0

Admission Requirements

12 ACT 2.5 GPA

800 GRE

1325 SAT

30-35 SEM HRS

Course Requirements - list number of courses needed whether thesis or not

Scholarship, Fellowship, Research, etc.-available

Scholarships 12

Fellowships 6

Research 6

Language of Instruction English

Total Numbers of Students Graduated

National Administration 100%

Foreign Scholarship 45%

Research 65%

Indicate % of funding by Government Industry Other (specify)

Staff Numbers: Totals Faculty Full Time (3) Part Time (3) Industry, Instructors (5) Speakers (.....)

Industry Input (Financial Admin, etc.) Curriculum Development (✓) Financial Admin, etc. (✓) Curriculum Development (✓) Industry Liaison (✓)

Comments

February 1/1th, 1981.

Study of Construction Programmes

Name of Institution **Michigan Technological University**
 Faculty/School **Department of Civil Engineering**
 Address **Houghton, Michigan 49931**
 Name, Title of Contact **Dr. V. B. Whitwood, Department Chairman**
 Name, Title of Responder **C. Edwin Rattenhoff, Lecturer**
 Programme/s offered **Degree Master Ph.D. Non-deg. Certificate Programme Specif**

Year Programme Established **Note (1)**
 Duration (years) - length of Programme

Enrollment
 Current Part Time **5**
 Current Full Time **1**
 Other (specify) **X**
 of which
 National **6**
 Foreign **0**

Admission Requirements **BSCE**
 Course Requirements - list number of courses needed whether thesis or not **59 Cr. Report**
 Scholarship, Fellowship Bursaries, etc. available **X**

Language of Instruction **English**
 Total Numbers of Students Graduated (No Records Available)
 National **—** Foreign **—**
 Administration **—** Scholarship **—** Research **—**
 Indicate 2 of funding by Government Industry Other(specify)
 Staff Numbers: Totals Faculty Full Time (2) Part Time () Industry,Instructors (3) Note
 (Indicate #s) Speakers
 Industry Input Financial Administrative () Curriculum Development (X)
 (Please tick) Scholarship,Bursaries etc.() Overseeing Body Industry Liaison (X)

Comments
 Note(1): Construction option available to undergraduates.
 (2): Program is interdisciplinary with the school of Business Administration.
 (3): Varies - no set pattern or number.

Course, Titles, Descriptions Indicate Text Title (if any)
 * CE 432 Heavy Construction
 * CE 433 Building Construction
 * CE 434 Construction Engineering
 CE 501 Civil Engineering I - Project Delivery Systems
 CE 502 Civil Engineering II - Financial and Management Control of Projects
 CE 503 Civil Engineering III - Decision Making - Value Management
 BA 570 Management Theory and Practice
 BA 510 Computer Applications in Business
 BA 524 Managerial Accounting I
 BA 525 Managerial Accounting II
 BA 547 Managerial Finance
 Plus
 4 CE Technical Electives (8 CE electives if courses marked * have been taken as undergraduate)
 Technical Report

Educational Programme Objectives: To expand the Civil Engineer's knowledge of project delivery systems both in theory and practice, and to broaden his perspective to the business management area. To follow through with the premise that project delivery is the physical goal of design and the responsibility of the Civil Engineering profession.

Research (Please tick) Organizational (Applied) (X) Engineering (Part) ()

Research Funding (Indicate source & amount (US \$))

Describe Nature/objectives of Research and

Research Facilities (if any)

Are there any special features of your programme. Please indicate.
 • The program is oriented toward the management of construction, but places emphasis on "Construction Management" as a unique project delivery system.
 • Both the theory and the practice of CM is covered, including strategy, financial and management control, operations, administration and marketing of services.

February 17th, 1981.

Name of Institution New Mexico State University
 Faculty/School Civil Engineering Dept. / College of Engineering
 address
 Name, Title of Contact Conrad G. Keyes, Jr., Prof. & Head
 Name, Title of Respondent Conrad G. Keyes, Jr., Prof. & Head
 Programme/s offered Degree Bachelor Master Ph.D Non-deg. Part of
 Certificate Programme Spec

Year Programme Established 1908 1955 1964
 Duration (years) - length 4 1-2 2-3
 of Programme

Enrollment

Current Part Time 400 27 9
 Current Full Time

Other (specify)

of which

National

Foreign

Admission Requirements

Course Requirements - list
 number of courses needed
 whether thesis or not

Scholarship, Fellowship
 Bursaries, etc. available

Language of Instruction

English

Total Numbers of Students Graduated
 Undergraduate 1175

Masters 210 29
 Doctors 29

Indicate % of funding by

Government

Industry

Individuals 0

Staff Numbers: Totals
 (Indicate #)

Faculty Full Time (65) Part Time: (7) Industry, Instructors ()
 Speakers ()

Industry Input
 (Please tick)

Financial Administrative () Curriculum Development ()
 Scholarship, Bursaries etc. () Overseeing Body Industry Liaison ()

Comments

Course, Title, Descriptions
 Indicate Text Title (if any)

CE 450 - Engineering Economy and Law - Discounted cash flows,
 economics of engineering projects, contracts and
 specifications - Engineering Economy by Gontiel.

CE 471 - Highway Engineering - Administration, planning, control,
 construction, and pavements - Highway Engineering
 by Opatoby.

CE 477 - Construction Engineering - Construction planning,
 equipment, and methods - Construction Planning,
 Equipment and Methods by Rerity.

CE 485 - Design of Earth Dams - Engineering designs of earth dams,
 site selection, foundation inspection & treatment, stability
 analysis, seepage analysis, and construction.

CE 485 - Site Investigation - Geological factors affecting Engineering
 Construction and geological investigation methods and
 techniques for engineering site selection.

Educational Programme Objectives:

Designed to provide a broad background in design, construction,
 and the operation of engineering works. The curriculum is so
 arranged that students may do specialized work in one or more areas

Research (Please tick)

Organizational (Applied) () Engineering (Iard) (✓)

Research Funding

(Indicate source & amount (US \$))

DoE and state of New Mexico - \$1,000,000

Describe Nature/objectives
 of Research

and

Research Facilities (if any)

Design and Inspection of Campus Geothermal
 Project. Design and Analysis of Pavement
 Construction.

Materials Testing Laboratories. Structural Analysis Laboratory.
 Rock Mechanics & Soil Mechanics Laboratories.

Are there any special features of your programme. Please indicate.

New joint AGC student chapter between
 NMSU and UTEP.

Scholarships in construction amount to \$3000.

February 17th, 1981.

CUB - WIS
Study of Construction Programs

Name of Institution NORTH CAROLINA STATE UNIVERSITY

Faculty/School Department of Civil Engineering
Address Raleigh, NC 27650, USA

Name, Title of Contact Prof. S. W. Munnally

Name, Title of Respondent same

Programme/s offered Degree Bachelor Degree Master Ph.D. Non-deg. Diploma Certificate Programs Specify Other

| Year Programme Established Duration (years) - length of Programme | 1976 | | | 1976 | | | Professional 1976 |
|---|---|---------|------|------|------|------|----------------------|
| | 1954 | 1976 | 1976 | 1976 | 1976 | 1976 | |
| Enrollment | | | | | | | |
| Current Part Time | 0 | 0 | 0 | 0 | 0 | 0 | |
| Current Full Time | 192 | 11 | 0 | 0 | 0 | 0 | |
| Other (specify) of which | | | | | | | |
| National | 184 | 5 | | | | | |
| Foreign | 8 | 6 | | | | | |
| Admission Requirements | HS | BS | | | | | BS |
| Course Requirements - list number of courses needed whether thesis or not | 2.25 PGPA | 3.0 GPA | | | | | 2.5 GPA |
| Scholarship, Fellowship Bursaries, etc. available | Limited scholarships & fellowships; teaching and research assistantships | | | | | | 30 a. hr. |

Language of Instruction English

Total Numbers of Students Graduated

Indicate % of funding by

Staff Numbers: Totals
(Indicate %)

Industry Input
(Please tick)

Comments

Course, Titles, Descriptions
Indicate Text Title (if any)

Undergraduate:

Construction Engineering I (text: CONSTRUCTION METHODS AND MANAGEMENT)
Construction Engineering II (text: BUILDING CONSTRUCTION)
Cost Analysis and Control (text: CONSTRUCTION PROJECT MANAGEMENT)
Legal Aspects of Contracting (text: CONTRACTS, SPECIFICATIONS & LAW FOR ENGRS)
Construction Engineering Project (no text)
Other courses common to civil engineering curriculum

Graduate:

Construction Planning and Scheduling (text: CONST PERFORMANCE CONTROL BY NETWORK)
Construction Productivity (text: METHODS IMPROVEMENT FOR CONST MANAGERS)
Building Construction Systems (text: none)
Construction Equipment Systems (text: MANAGING CONSTRUCTION EQUIPMENT)
C.E. Project (no text)
Plus 2 other courses in major and 3 courses in minor

Educational Programme Objectives: Develop technically competent, innovative construction engineers and managers

Research (Please tick)

Research Funding
(Indicate source & amount (US \$))

Describe Nature/Objectives
of Research

Research Facilities (if any)

Laboratories: structural, materials, soils, water;
extensive computer facilities, incl. computer graphics;
time-lapse photography equipment.

Are there any special features of your programme. Please indicate.

BS degree "Civil engineering/Construction Option" is ABET-accredited as a construction engineering degree. Graduate students may incorporate courses at Duke Univ. and UNC-Chapel Hill in their program at no additional cost.

Course, Title, Description: Indicate Text Title (if any)

1. CE 431 - Civil Engineering Construction: Estimating the production of major construction equipment, drilling and blasting of rock, concrete methods, and design of formwork.
2. CE 432 - Construction Operations Analysis: Techniques for measuring construction productivity, principles of preplanning, use of Time-lapse photography, Critical Path Method (CPM), cost accounting, and construction safety.
3. AE 472 - Building Construction Management I: Components of building industry; design and construction contracts; bidding procedures; project scheduling, planning and organization.
4. AE 473 - Building Construction Management II: Building construction sequences; bonds, liens and arbitration; subcontracting.
5. AE 474 - Building Construction Estimating: Construction estimating and cost engineering; quantity take off, pricing and bid preparation; estimating and cost accounting by computer.
6. AE 475 - Building Construction Engineering I: Project planning, supervision, and inspection of architectural and structural operations in major buildings.
7. AE 476 - Building Construction Engineering II: Project planning, supervision and inspection of HVAC, electrical and plumbing systems in major buildings.
8. CE 531 - Legal Aspects of Construction: Basic legal doctrines and techniques, legal and contractual responsibilities of each party, analysis of a construction contract, professional practice problems.
9. CE 532 - Powerplant Construction: Planning, engineering, and construction of large projects such as electric powerplants, regulatory and quality assurance impact, project control systems, construction labor considerations.
10. CE 550 - Engineering Construction Management: Organization, project planning, scheduling and control, development of a construction management system, requirements for bonding and insurance.
11. CE 598 - Personal Project Courses in: Construction Labor Relations, Advanced Scheduling Techniques, Statistical Quality Control of Construction Materials, etc.

Educational Program Objectives: The objective of the Master's Degree program is to provide specialized preparation for addressing the difficult technical, managerial, and organizational problems confronted by construction managers on residential, building, heavy and highway or industrial projects. The Ph.D. program is designed for those students who desire to prepare for a teaching or research career at the university level or a research career in the construction industry.

Research (Please tick)

Organizational (Applied (/) Engineering (Hard) (/)

1. Industry - \$50,000
2. Government - \$70,000

(Indicate source & amount (US \$))

Describe Nature/Objectives of Research and Research Facilities (if any)

- (1) Management, Construction and QA/QC Control practices on powerplant projects.
- (2) Statistical Quality Control of bituminous, base course, and embankment materials on construction projects.
- (3) Methods Improvement and Productivity Analysis on construction projects using Work Sampling and Time-lapse Photography techniques.
- (4) Computer Simulation of construction processes.
- (5) Legal aspects related to contract administration.
- (6) Competitive bidding strategy models.
- (7) Organizational and contract staffing requirements of state transportation departments.

Are there any special features of your programs? Please indicate. The program has established excellent contact with the construction industry in Pennsylvania and neighboring states as well as with branches of the federal government. The faculty are active nationally in various professional societies and have published widely in the fields of Quality Control, Methods Improvement and Construction Management. A text entitled "Planning Engineering, and Construction of Electric Generation Facilities" has been written by program Professors Jack W. Willenbrock and W. Randolph Thomas. (Valley Intercom.)

CLA - W65

Study of Construction Programmes

February 17th, 1981

| Name of Institution | The Pennsylvania State University |
|---------------------------|--|
| Faculty/School address | Dept. of Civil Engineering 212 Sachett Bldg. University Park, PA 16802 |
| Name, Title of Contract | Jack W. Willenbrock, Ph.D. |
| Name, Title of Respondent | Associate Professor, Dept. of Civil Engineering |
| Programme/s offered | Degree Bachelor Degree Master Degree Non-deg. Diploma Non-deg. Certificate Part of Programme Special |

| Year Programme Established | 1965 | 1968 | - | - | - |
|---|-------------------------|---------------------|---------------------|---------|---------|
| Duration (years) - length of Programme | 1 year | 3 years | - | - | - |
| Enrollment | 17 | 0 | - | - | - |
| Current Part Time | 2 | 0 | - | - | - |
| Current Full Time | 18 | 0 | - | - | - |
| Other (specify) of which | 17 | 0 | - | - | - |
| National | 3 | 0 | - | - | - |
| Foreign | 17 | 0 | - | - | - |
| Admission Requirements | BS in Civil Engineering | 8 Courses + Thesis | 18 Courses + Thesis | Limited | Limited |
| Course Requirements - list number of courses needed whether thesis or not | 8 Courses + Thesis | 18 Courses + Thesis | Limited | Limited | Limited |
| Scholarship, Fellowship Bursaries, etc. available | Limited | Limited | Limited | Limited | Limited |

Language of Instruction English

Total Numbers of Students Graduated

National 35 Foreign 5

Indicate % of funding by Government

Research 60%

Industry

Scholarship 50%

Other (specify)

40%

Staff Numbers: Total (Indicate \$'s)

Industry Input (Please tick)

Financial Administrative (/) Curriculum Development (/)

Scholarship, Bursaries etc. (/) Overseeing Body Industry Liaison (/)

Comments: Advisory groups from the residential, building, power plant and heavy construction areas assist in program development and analysis.

Speakers (-)

February 17th, 1981.

Study of Construction Programs

Name of Institution Pittsburgh State University

Faculty/School address Pittsburgh, KS 66762

Name, Title of Contact Gene Russell, Asst. Professor
Name, Title of Respondee Gene Russell, Asst. Professor

Programs/s offered Degree Bachelor Non-deg. Certificate Part of Other
Scholarship Master Ph.D. Diploma Program Specif.

Year Program Established 1966 1968
Duration (years) - length 4 2
of Program

Enrollment

Current Part Time 8

Current Full Time 132

Other (specify) of which

National 132
Foreign 8

Admission Requirements High School Diploma

Course Requirements - list see attached sheet
number of courses needed whether thesis or not

Scholarship, Fellowship Associated General Contractors, Metal Building Dealers,
Bursaries, etc. available Heavy Constructors Scholarships

Language of Instruction English

Total Numbers of Students Graduated

National 25/yr Foreign 8/yr
Administration Scholarship Research
100% 90% 100%

Indicate % of funding by Government

Industry 90%
Other (specify) University 10%

Staff Numbers: Totals (Indicate #s) Faculty Full Time () Part Time () Industry, Instructors ()
Speakers Variable

Industry Input (Please tick) Financial Administrative () Curriculum Development ()
Scholarship, Bursaries, etc. () Overseeing Body Industry Liaison ()

Comments

Course, Titles, Descriptions
Indicate Text Title (if any)

See attached sheet.

Educational Program Objectives:

It is our primary objective to educate our students so that they may gain a competence to obtain challenging and career-oriented jobs in the construction industry and related fields.

Research (Please tick)

Organizational (Applied) () Engineering (Harc) ()

Research Funding (Indicate source & amount (US \$))

Describe Nature/Objectives of Research and

Research Facilities (if any)

Are there any special features of your program. Please indicate.

OPTION 1
CONSTRUCTION ENGINEERING TECHNOLOGY

First Semester

FRESHMAN
English Comp 101.3
College Algebra 113.3
Plane Trigonometry 122.3
Social & Behavioral Science . . .3
Construction Materials 234 . . .3
15

SOPHOMORE
Construction Methods 235. . . .3
Intro Physics 1 100-1305
Statics 220.3
Humanities Elective.3
14

JUNIOR
Mechanical Systems 330.5
Str. Design Wood 5364
Residential Design 3323
Const. Surveying 537.3
Technical Writing 301.3
18

SENIOR
Str. Design Concrete 6334
Working Drawings 5343
Intro. Industrial Safety 593 . . .3
Approved Electives2
Const. Cost & Estimating 631. . .3
15

Second Semester

FRESHMAN
English Comp 1023
Construction Graphics 133. . .3
Calculus 150.5
Chemistry 105-106.5
16

SOPHOMORE
Mechanics of Materials. . . .3
Intro Physics II 101,131. . . .5
Speech 207.3
Economics 2073
Financial Accounting 201. . .3
17

JUNIOR
Electrical Systems 3313
Building Design 4323
Str. Design Steel 6324
Humanities Elective3
Computer Elective3
16

SENIOR
Const. Contracts & Specs 635/3
Const. Management3
Fdn. & Soil Mechanics 638 . .3
Approved Electives6
15

TWO-YEAR ARCHITECTURAL DRAFTING TECHNOLOGY

FIRST YEAR

Engineering Graphics 1 121 . . .3
English Comp. 1013
College Algebra3
Const. Materials3
Elective3
15

SECOND YEAR

Bldg. Design 432.3
Const. Surveying 5373
Basic Speech 207.3
Mechanical Systems 330.3
Elective.3
17

FIRST YEAR

Const. Graphics 1233
Residential Design 332. . . .3
English Comp. 1023
Plane Trig. 1223
Intro. to Computer 121 . . .3
15

SECOND YEAR

Working Drawings 534.3
Const. Cost & Est. 631 . . .3
Pictorial Drafting 526 . . .3
Electrical Systems3
Elective3
15

OPTION II
CONSTRUCTION MANAGEMENT

First Semester

FRESHMAN
English Comp. 1013
College Algebra 1133
Economics 2003
Humanities.3
Const. Materials3
15

SOPHOMORE
Construction Methods 235. . .3
Statics 221.3
General Psychology 155. . .3
Approved Electives6
15

JUNIOR
Mechanical Systems 3305
Str. Design Wood 5364
Residential Design 332. . . .3
Construction Surveying 537 .3
Technical Writing3
18

SENIOR
Str. Design Concrete 633 . . .4
Working Drawings 5343
Intro. Indust. Safety 593 . .3
Business Elective.3
Const. Cost & Est. 631 . . .3
16

Second Semester

FRESHMAN
English Comp. 1023
Const. Graphics 133.3
Plane Trigonometry 122 . . .3
Science Electives5
Approved Elective2
16

SOPHOMORE
Mechanics of Materials 224 . .3
Basic Speech 207.3
Humanities3
Financial Accounting 201. . .3
Approved Electives.3
15

JUNIOR
Electrical Systems 331. . . .3
Building Design II 432. . . .3
Str. Design Steel 632 . . .4
Computer Elective3
Approved Elective3
16

SENIOR
Const. Contracts & Specs. . . .3
Const. Management.3
Fnd. and Soil Mechanics 638 .3
Human Rel. in Ind. Set. 680. .3
Approved Elective3
15

C13 - 065
Study of Construction Programs
February 17th, 1961.

Name of Institution **PRATT INSTITUTE**
 Faculty/School **CONSTRUCTION MANAGEMENT**
 address **HIGGINS HALL, BROOKLYN, NEW YORK 11205**
 Name, Title of Contact **NATHAN STREITMAN, CHAIRMAN**
 Name, Title of Respondent **SAM**

| Program/s offered | Degree | Degree | Non-deg. | Part of | Other |
|--------------------------------------|----------|--------|----------|-------------|----------|
| | Bachelor | Master | Diploma | Certificate | Programs |
| CONSTRUCTION MGMT. | | | | | |
| Year Programs Established | 1963 | | | | 1954 |
| Duration (years) - length of Program | 4 | | | | 2 |
| Enrollment | 119 | | | | |
| Current Part Time | 77 | | | | |
| Current Full Time | 42 | | | | |
| Other (specify) of which | | | | | |
| National | 109 | | | | |
| Foreign | 10 | | | | |

Admission Requirements **SATISFACTORY HIGH SCHOOL DIPLOMA OR EQUAL.**
 Course Requirements - List 132 CREDITS, TOTAL IN 5 AREAS: LIBERAL ARTS & SCIENCES, BUSINESS MANAGEMENT, DRAWING & DESIGN, CONSTRUCTION THEORY & CONSTRUCTION MANAGEMENT
 number of courses needed whether thesis or not
 Scholarship, Fellowship, Bursaries, etc. available **NEED SCHOLARSHIP; AID IN SCHOLARSHIP; GENERAL SCHOLARSHIPS.**

Language of Instruction **BROOKLYNSE ENGLISH**

| Total Numbers of Students Graduated | National | 544 | Foreign | 55 |
|--|------------|---------------|--------------|----|
| Indicate % of funding by | Government | | Scholarship | |
| Industry | | | 10 | |
| Other (specify) | | | 10 | |
| Faculty Full Time (e) Part Time (25) | | 100 (PRIVATE) | 80 (PRIVATE) | |
| Staff Numbers: Totals (Indicate #s) | | | | |
| Industry Input (Please tick) | | | | |
| Financial Administrative () Curriculum Development () Scholarship, Bursaries etc. () Overseeing Body Industry Liaison () | | | | |

Comments

| Course, Title, Descriptions Indicate Text Title (if any) | Architectural Drawing |
|---|---|
| Intro to Constr Mgmt | Space Design |
| Real Estate Finance | Arch Design Principles I & II |
| Constr Cost Analysis I & II | Fundamentals of Accounting |
| Intro to Value Engineering | Business Law |
| Basic Real Estate | Labor Relations |
| Constr Mgmt Theory | Intro to Management |
| Pract'l Constr Mgmt | Computer Appreciation & Programming |
| Building Codes and Zoning | English Comp |
| Senior Seminar & Thesis I & II | Interpersonal Speech Communication |
| Construction Law | Reports & Correspondence |
| Wood/Steel Constr | Cultural History Electives |
| Concrete & Spec Constr | General Psychology |
| Contemp Constr Techniques | Introductory Economics |
| Wood/Steel Str Des | Elem of Math Anal |
| Comp Str Des | Physics I (Mechanics) & II (Elect/Sound) |
| Mech & Elect Equip I & II | Electives Professional, Liberal, Sciences |
| Site Engineering I & II | Free |
| Specifications | |
| Hist of Arch & Tech I & II | |
| Graphic Presentation | |

Educational Program Objectives: TO PREPARE STUDENTS FOR PROFESSIONAL CAREERS IN CONSTRUCTION AS CONTRACTORS, CONSTRUCTION MANAGERS, PROJECT MANAGERS, E1 AND TO WORK ALONGSIDE ARCHITECTS AND ENGINEERS AS KEY MEMBERS OF THE OWNER'S CONSTRUCTION TEAM.

Research (Please tick) ☒ Engineering (Hard) ()

Research Funding (Indicate source & amount (US \$) --

Describe Nature/objectives of Research --

Research Facilities (if any) NEW YORK CITY AND SURROUNDINGS

Are there any special features of your program. Please indicate.

ONE UNIQUE FEATURE OF PRATT'S CONSTRUCTION MANAGEMENT PROGRAM IS THAT

IT IS THE ONLY ONE IN THIS AREA THAT IS OFFERED IN THE EVENINGS.

Study of Construction Programs

Name of Institution Purdue University School of Engineering and Technology

at Indianapolis

Faculty/School Department of Construction Technology

Address 799 West Michigan St., Indianapolis, IN 46202

Name, Title of Contact Professor Glenn A. Brackney, Chairperson

Name, Title of Respondent Same

Programme/s offered Degree Degree Non-deg. Non-deg. Part of Other
Bachelor Master Ph.D Diploma Certificate Programme Specif

Year Programme Established 1968

Duration (years) - length 4 years

of Programme

Enrollment

Current Part Time 160 (12 semester credit hours or less)

Current Full Time 110

Other (specify) Full time equivalent (FTE) 195

of which

National 265

Foreign 5

Admission Requirements High school graduate with 6 semesters English, 2 semesters algebra, 2 semesters geometry and two semesters laboratory science.

Course Requirements - list Minimum of forty-four courses requiring 133 semester number of courses needed credit hours of work.

whether thesis or not

Scholarship, Fellowship Some scholarships available.

Bursaries, etc.-available

Language of Instruction English AAS 337 AAS 5

BS 227 BS 3

Total Numbers of Students Graduated National Foreign

(Fall 1968 to spring - 1980) Administration Scholarship Research

Indicate % of funding by Government 67% (State of Indiana)

Industry

Other(specify) 33% Tuition

Staff Numbers: Totals Faculty Full Time (8) Part Time (10) Industry,Instructors ()
(Indicate #'s) Speakers

Industry Input

(Please tick) Financial Administrative () Curriculum Development (X)

The department has Industry Advisory Councils for each program of study. These

are Architectural Technology, Civil Engineering Technology and Construction Technology.

Comments The Department of Construction Technology does not have maximum enrollment

for resident, non resident, or foreign students.

Course, Titles, Descriptions

Indicate Text Title (if any)

See attached sheets for the two programs of study granting the B.S. degree in Construction Technology.

See attached sheets for course descriptions.

See attached sheets for course number, title, text and reference texts.

Educational Programme Objectives:

To educate and train Professional Constructors to manage construction and become the master builders of the future.

Research (Please tick)

Organizational (Applied) () Engineering (Hard) ()

Research Funding (Indicate source & amount (US \$) None

Describe Nature/objectives of Research Would like to have research for improving productivity in the construction industry.

Research Facilities (if any)

Soils laboratory, materials test laboratory, structural test laboratory.

Are there any special features of your programme. Please indicate.

The Department of Construction Technology offers two year programs in Architectural Technology and Civil Engineering Technology granting the Associate in Applied Science (AAS). These are combined with the upper division in construction for two 2+2 programs granting the B.S. degree in Construction Technology. The two 2+2 programs make it easier for students to transfer from junior and community colleges with similar programs and receive their B.S. degree from Purdue University. Day and evening courses are offered in all programs of study so that students may work full time and go to school part-time to complete their education.



The 1981 Construction Management Programme builds on the carefully considered shift in emphasis introduced last year. Then we offered elective courses to strengthen the programme's appeal to all sectors of the industry without diluting the core of the curriculum. This new dimension to the CMP provided extremely successful and in 1981 it will again be possible for delegates involved in either project or resource management to obtain specialist instruction in their particular area of interest. As always basic disciplines provide the academic base for the programme and lead into pragmatic industry-orientated courses which stress the application of both techniques and concepts in the dynamic construction environment.

The maturity of the programme is further reflected in the fact that every member of this year's teaching team has had experience on previous CMPs. Professor Boyd Paulson will again visit, continuing our long established links with the Construction Faculty at Stanford University. Mr Peter Thompson from the Project Management Group at the University of Manchester Institute of Science and Technology will be visiting South Africa for a third time.

Over sixty different firms have sponsored delegates to attend the programme and each year the mix of organisations represented includes both small and large contractors as well as clients and consultants. We believe that the CMP provides a unique opportunity for all parties involved in the construction process to meet in a stimulating non-competitive atmosphere to learn from each other and to discuss problems of mutual interest. We, as well as the industry, are the beneficiaries.

PROFESSOR JOHN SIMPSON
Director

The Construction Management Programme is an intensive six week executive programme which has been designed:

- To provide professional management education to experienced managers active in the construction industry so that their technical expertise will be extended to cope with their changing responsibilities.

- To provide an opportunity for managers drawn from all sectors of the industry to meet and share valuable knowledge, in order to gain fresh perspectives over a wide area of management experience.

The curriculum has been designed to incorporate a number of elective courses in specialist areas and as such, it has definite practical appeal to clients, consulting engineers, contractors and project managers.

The Construction Management Programme will run at the Graduate School of Business, University of Cape Town from July 19 to August 28 1981. Delegates will be required to live in residence.

Delegates attending the programme will have had substantial management experience within the industry and will carry a corresponding level of responsibility. The programme is of post graduate standard and a degree is desirable though not essential. Delegates should be nominated by their employers.

Instruction

Areas of

BASIC DISCIPLINES

THE HUMAN FACTOR
Human relations within the construction process are becoming increasingly important. The course relates skills in working and communicating with both individuals and groups. (6%)

FINANCIAL MANAGEMENT
The course reviews the basis of accounting systems as they relate to management. It is designed to provide the management personnel with the understanding of the preparation and analysis of financial statements as developed. (10%)

INDUSTRIAL RELATIONS
The course reviews South Africa's industrial relations system, analyses sources of conflict in a company, presents channels through which communication and conflict reduction can be achieved and introduces skills necessary to use these effectively. (8%)

APPLICATIONS

MARKETING
The marketing concept has applications in the construction industry. The course defines the role of marketing and describes the elements of a marketing plan for construction and professional services. (4%)

EQUIPMENT MANAGEMENT
This course applies engineering theory to the management of construction equipment. A laboratory is developed for maintenance and replacement and emphasis is placed on equipment information systems. (7%)

PROJECT EVALUATION
The course applies engineering economy theory to broaden an understanding of and outline the client thinking in the area of capital project budgeting for both private and public sectors. (7%)

PROJECT PLANNING AND CONTROL
Numerous techniques for the control of time in construction have been developed and tested. The course seeks to identify those which have been successful and to develop a project approach to the use of sophisticated project control systems. (8%)

CONTRACT LAW
The objectives of the course is to study the general principles of South African law in relation to construction contracts. The management skills necessary to identify legal and relative legal problems are stressed. (15%)

CONSTRUCTION TECHNOLOGY
There is a need to recognize the role of construction engineering as a high value technical discipline. The course reviews the role of construction engineering, to provide a base for technological improvement in the management and execution of construction projects. (11%)

CONTRACT STRATEGY
The course has been designed to illustrate the manner in which the conditions of contract, methods of measurement and bills of materials are used in the preparation of a contract. Various forms of construction contracts are also studied. (10%)

DOCUMENTATION AND DISPUTES
The principles of contract law are applied in the preparation and interpretation of contract documents. The role of standard forms of contract is investigated. Avenues for the resolution of contractual disputes are explored. (8%)

OPERATIONS ANALYSIS
The course is directed at managers responsible for the efficient use of resources. It introduces the analysis of current operations, analysis techniques and their application in obtaining meaningful cost reductions. (6%)

PROJECT MANAGEMENT
The course introduces the concepts of project management and construction management. It covers the project cycle, from conception to commissioning and completion. The attributes, role and qualification of the construction manager are stressed. (9%)

NOTE: The figure in brackets denotes the percentage the each subject contributes to the programme.

CIB - W65
Study of Construction Programmes

Name of Institution Southwest Missouri State University
Faculty/School Industrial Education & Technology Department
address 901 South National
Springfield, MO 65802
Name, Title of Contact Dr. Charles McKenzie
Name, Title of Respondent Professor of Industrial Education & Technology
Programme/s offered Degree Degree Non-deg. Part of Other
Bachelor Master Ph.D. Diploma Certificate Programme Specific

Year Programme Established
Duration (years) - length 4 yr. B.S. Degree
of Programme

Enrollment
Current Part Time 57
Current Full Time 5
Other (specify)
of which
National 982
Foreign 21

Admission Requirements High School Diploma
Course Requirements - list 64 semester hours, major 15 semester hrs., minor 124 sem hrs total
number of courses needed
whether thesis or not
Scholarship, Fellowship 5 Private Scholarships and regents scholarships
Bursaries, etc. available

Language of Instruction English
Total Numbers of Students Graduated National Foreign
Administration Scholarship Research
Indicate % of funding by Government 99% 0 0
Industry 0 .01% 0
Other(specify)
Staff Numbers: Totals Faculty Full Time (4) Part Time (3) Industry, Instructors (1)
(Indicate #)'s Speakers
Industry Input Financial Administrative (0) Curriculum Development (0)
(Please tick) Scholarship, Bursaries etc. (X) Overseeing Body Industry Liaison ()

Comments

Course, Titles, Descriptions
Indicate Text Title (if any)
120 190 Introduction to Construction, Construction Materials, Methods, Careers
390 Building Cost and Estimating, Building Estimator's Reference Book
391 Advanced Construction Practices, Principles and Practices of Heavy Construction
392 Internship, No text required
MNR 175 Plane Surveying
CSD 110 & 111 Physical Geology Lecture and Laboratory
120 356 Industrial Supervision, What Every Supervisor Should Know
337 Materials Testing, Technology of Industrial Materials
322 Building Construction Practices, Construction Materials, Methods, Careers
310 Architectural Mechanical Systems, Mechanical and Electrical Systems in Construction and Architecture
252 Industrial Processes and Materials, Materials and Processes in Manufacturing
250 Industrial Safety, Accident Prevention Manual for Industrial Operations
214 Commercial Architectural Design, Structural Detailing for Technicians
210 Architectural Drafting, Architectural Residential Drawing and Design
150 Introduction to Manufacturing Management, Organization for Production
141 Applied Electricity, Industrial Electricity & Student Guide
132 Welding I, Modern Welding
121 Woods, Machines, and Processes, Woodworking for Industry & Student Guide
110 Technical Drafting, Engineering Drafting & Graphic Technology

Educational Programme Objectives:

To provide students with the basic technical knowledge and managerial skills necessary for an entry level mid-management position in the construction industry.

Research (Please tick) Organizational (Applied) () Engineering (Hard) ()

Research Funding (Indicate source & amount (US \$)) NA

Describe Nature/objectives of Research NA

Research Facilities (if any) NA

Are there any special features of your programme. Please indicate.
Internship available

February 17th, 1981.

Name of Institution University of Florida
 Faculty/School Department of Civil Engineering Rm 346 W. Hall
 address Gainesville, Fla. 32611
 Name, Title of Contact Prof. J. S. Sub
 Name, Title of Respondent

Course, Titles, Descriptors
 Indicate ext title (if any)

Programme/s offered Degree Bachelor Degree Master Ph.D Non-deg. Certificate Part of Other Specify

Year Programme Established 1963 1971

Duration (years) - length of Programme

Enrollment

Current Part Time

Current Full Time

Other (specify)

of which

National

Foreign

Admission Requirements

Course Requirements - list

number of courses needed (40 weeks 30 semester hours)

whether thesis or not

Scholarship, Fellowship

Bursaries, etc. available

Language of Instruction

Total Numbers of Students Graduated

National ManyForeign Many

Indicate % of funding by

Government

Industry

Other (specify)

Staff Numbers: Totals

(Indicate %)

Industry Input

(Please tick)

Financial Administrative () Curriculum Development (X)

Scholarship, Bursaries etc. (X) Overseeing Body Industry Liaison (X)

Comments

62 / FIELDS OF INSTRUCTION

CHM 6520—Chemical Physics (3) Interatomic and intermolecular forces. Energy transfer and reaction in molecular collision processes. Computational aspects of scattering theory.

CHM 6580—Special Topics in Physical Chemistry (1-3; max: 12) Lectures or conferences covering selected topics of current interest in physical chemistry.

CHM 6590—Physical Chemistry Seminar (1) Attendance required of graduate majors in physical chemistry. Prereq: graduate course in physical chemistry. Presentation of one seminar. S/U option.

CHM 6620—Advanced Inorganic Chemistry (3) The crystalline state, acid-base, nonaqueous solvent, inorganic mechanisms.

CHM 6622C—Inorganic Preparations (4) Lectures and laboratory experiments showing the reactions and techniques used in the synthesis of inorganic compounds.

CHM 6623—Chemistry of the Metals (3) Prereq: CHM 6471, 6730. Relation of properties to atomic, molecular, and crystal structures.

CHM 6624—Chemistry of the Nonmetals (3) Prereq: CHM 6730. Relations of properties to atomic, molecular and crystal structures.

CHM 6680—Special Topics in Inorganic Chemistry (1-3; max: 12) Lectures or conferences on selected topics of current research interest in inorganic chemistry.

CHM 6690—Inorganic Chemistry Seminar (1) Attendance required of graduate majors in inorganic chemistry. Prereq: graduate course in inorganic chemistry. Presentation of one seminar. May be repeated for credit. S/U option.

CHM 6710—Applied Molecular Spectroscopy (3) Applications and comparison of methods in analysis and molecular structure determination.

CHM 6720—Chemical Dynamics (3) Basic concepts of rate laws, collision theory, and transition state theory; an introduction to reaction dynamics, structural dynamics, and quantitative structure-reactivity correlations.

CHM 6730—Chemical Transformations (3) Important types of chemical reactions and their application to organic and inorganic synthesis.

CHM 6905—Individual Problems, Advanced (3-5; max: 10) Prereq: consent of faculty member supervising the work. Double registration permitted. Assigned reading program or development of assigned experimental problem. S/U Option.

CHM 6910—Supervised Research (1-5)

CHM 6935—Chemistry Colloquium (1; max: 7) Topics presented by visiting scientists and local staff members. S/U.

CHM 6940—Supervised Teaching (1-5)

CHM 6971—Research for Master's Thesis (1-15)

CHM 7485—Special Topics in Theory of Atomic and Molecular Structure (1-3; max: 9) Prereq: CHM 6482 or PHS 6226, or equivalent. Mathematical techniques used in atomic, molecular, and solid-state theory. The one-electron approximation and the general quantum-mechanical many-body problem. Selected advanced topics.

CHM 7980—Research for Doctoral Dissertation (1-15)

CHS 5110—Radiochemistry (2) Prereq: CHM 3401 or CHM 4412 or consent of instructor. Properties of radioactive nuclei, nature of radioactivity, nuclear structure, nuclear reactions, interaction of radiation with matter, chemical aspects of radioactivity, and applications of nucleonics to chemistry.

CHS 5110L—Radiochemistry Laboratory (1) Prereq: CHM 3120C and 3401 or 4412, or consent of instructor. Radioactivity detection, radiochemical separations and analyses, radiochemistry laboratory techniques, the practice of radiological safety, and tracer applications of radioisotopes in chemistry and other fields.

CHS 6120—Nuclear Chemistry (3) Prereq: CHS 5110. Radioactivity, nuclear structure, decay processes, nuclear reactions.

CIVIL ENGINEERING

College of Engineering

GRADUATE FACULTY 1980-81

Chairman & Graduate Coordinator: J. H. Schaub. Professors: B. A. Benedict; H. K. Brooks; B. A. Christensen;

D. U. Deere; B. E. Ruth; J. H. Schaub; J. H. Schmettmann; M. W. Self; B. D. Spangler; J. A. Watleworth. Associate Professors: C. A. Collier; K. G. Courage; J. L. Davidson; J. L. Eades; C. O. Hays; G. Long; J. D. Rumble; W. H. Zimpfer. Assistant Professor: J. M. Lybas.

The following graduate degrees are offered to prepare qualified students for the professional practice of civil engineering: Master of Engineering, Master of Science, Engineer, and Doctor of Philosophy. All degree programs include areas of concentration in the specialties of construction, geotechnical engineering, hydraulics, structures, and transportation engineering. All degrees except the Ph.D. are available in a thesis or nonthesis program.

Resident graduate students are required to register for a minimum of two credits at one credit per semester for ECI 6936. This credit is not applicable to the requirement for any degree. Nonthesis degree students must successfully complete a report of substantial engineering content for a minimum of two hours credit in ECI 6974. Minor or supporting work is encouraged from a variety of related or allied fields of study.

CES 5305—Design of Structural Systems (2) Prereq: CES 4705, 4607. Fundamental characteristics of structural systems. Economic and architectural considerations. Building frames and connections. Plate girders. Special structures.

CES 5325—Design of Highway Bridges (3) Prereq: CES 4607, 5726. Analysis by influence lines, slab and girder bridges, composite design, prestressed concrete, continuity, arch bridges, design details, highway specifications.

CES 5607—Behavior of Steel Structures (3) Prereq: CES 4607. Plastic analysis and design of beams and frames. Buckling and stability problems. Connections.

CES 5726—Design of Concrete Systems (3) Prereq: CES 4705. Strength design of members and frames, torsion, two-way slabs, design of building systems, prestressed concrete.

CES 5801—Design and Construction in Timber (2) Prereq: consent of instructor. Analysis and design in timber. Beams, columns and connections. Timber structure. Plywood beams, panels, diaphragms. Laminated beams and frames. Formwork.

CES 6106—Advanced Structural Analysis II (4) Prereq: EGM 3400, CES 6108. Continuation of CES 6108: Finite element method. Numerical methods, topics in structural dynamics, code provisions for seismic and wind loading.

CES 6108—Advanced Structural Analysis I (4) Prereq: CES 4607, 4705. Traditional methods of analyses for forces and deformations; modern matrix methods including direct stiffness method.

CES 6136—Advanced Structural Laboratory (2) Prereq: CES 4607, 4705. Model studies and analysis. Mechanics of similitude and dimensional analysis applied to static and dynamic structural problems. Research topics.

CES 6526—Nonlinear Structural Analysis and Design (2) Prereq: CES 6108. Sources of nonlinearity. Tangent stiffness method. Beam-columns on elastic foundations. Discrete methods for soil-structure interaction.

CES 6551—Design of Folded Plates and Shells (3) Prereq: CES 4607, 4705. Analysis for membrane stresses; pressure vessels, secondary bending stresses. Design of shell systems and folded plates. Design details.

CES 6706—Advanced Reinforced Concrete (3) Prereq: CES 4704, 5726. Torsion in structural members. Ultimate load theories and application to design. Yield-line theory for slabs. Shear walls, combined shear walls and frames. Research topics.

CES 6716—Advanced Prestressed Concrete (2) Prereq: CES 4704, 5726. Continuity in prestressed concrete; design of connections, post-tensioning applications, segmental construction. Circular prestressing. Research topics.

ECI 5124—Civil Engineering Systems (3) Civil engineering applications of operations research techniques, models of scheduling, linear programming, queueing theory, and simulation.

ECI 5125—Construction Equipment and Procedures (2) Prereq: ECI 4145 or consent of instructor. Design and optimization of equipment systems for heavy construction.

ECI 5147—Construction Planning and Scheduling (2) Prereq: ECI 4145. Planning, scheduling, organizing and control of civil engineering projects with CPM and PERT. Application of optimization techniques.

ECI 5156—Value Engineering Theory (3) Value engineering concepts, function analysis system techniques (FAST), diagramming, creativity, matrix evaluation, design-to-cost, life cycle costing, human relations and strategies for organizing, performing and implementing value engineering work.

ECI 5157—Civil Engineering Feasibility Analysis (3) Prereq: ECI 4137 or equivalent studies in time-value of money. Theory and practice of feasibility studies for proposed civil engineering projects and other related areas of interest.

ECI 5166—Legal Aspects of Civil Engineering (3) Engineer's view of contracts for design and construction. Legislation and policy affecting labor-management relationships in construction.

ECI 5186—Public Works Planning (3) Functional approach to planning and implementing public works for urban areas. Examines public works needs of residential, commercial, industrial and other land uses.

ECI 5235—Open Channel Hydraulics (3) Prereq: ECI 4214 or consent of instructor. Classification of flow. Normal depth. Specific energy and critical depth. Gradually varied flow. Transitions.

ECI 5265—Hydraulics Machinery (2) Prereq: ECI 4214 or consent of instructor. Selection and operation of hydraulic motors, pumps and transmissions. Specific speed. Cavitation. Surge tanks.

ECI 5325—Foundation Design (3) Prereq: CES 4705, ECI 4305 or consent of instructor. Investigations, bearing capacity, and the analysis and design of shallow footings, walls, and deep piled foundations.

ECI 5335—Insitu Measurement of Soil Properties (3) Prereq: ECI 4305, 4314 or consent of instructor. Methods of soil exploration; techniques of soil sampling and insitu testing. Emphasis on field work and demonstrations.

ECI 5355—Earth and Rockfill Dams (2) Prereq: ECI 4305. Design requirements, construction techniques, compaction control, soil testing and sampling, foundation preparation, and field instrumentation.

ECI 5437—Experimental Determination of Soil Properties I (3) Prereq: ECI 4305. Advanced laboratory determination of engineering properties of soils; hydrometer analysis, controlled rate of strain consolidation, soil suction, permeability, and triaxial testing.

ECI 5575—Remote Sensing Methods and Engineering Applications (3) Prereq: TTE 4104. Introduction into remote sensing and imaging systems including photographic and digital processing methods for image analysis. Emphasis on use of LANDSAT imagery and aerial photography for engineering applications.

ECI 5625—Groundwater Flow I (3) Prereq: ECI 4214 or consent of instructor. Porous media flow. Darcy's law. Conservation of mass. Laplace equation. Flownets. Well hydraulics.

ECI 6045—Computer Applications in Geotechnical Engineering (2) Prereq: ECI 4041, 6316 or consent of instructor. Application of computer solutions to geotechnical engineering problems.

ECI 6153—Civil Engineering Practice (2-4; max: 4) Prereq: graduate status. Problems and case histories of civil engineering projects including social, legal, environmental, and technical aspects.

ECI 6154—Civil Engineering Operations (2-4; max: 4) Prereq: graduate status. Application of quantitative methods of decision making to major civil engineering problem areas.

ECI 6223—Numerical Models in Hydraulics (3) Prereq: ECI 4214 or consent of instructor. Application of numerical methods to hydraulic engineering problems; dispersion, porous media flow, river and estuarine mechanics, thermal diffusion.

ECI 6227—Diffusive and Dispersive Transport (2) Prereq: ECI 4214 or consent of instructor. Introduction to diffusive and dispersive transport processes in flowing water. Fick's law.

ECI 6228—Hydraulic Laboratory and Field Practice (3) Prereq: ECI 4214 or consent of instructor. Hydraulic model laws

and their use in undistorted and distorted models with movable or fixed beds. Instrumentation. Data acquisition system.

ECI 6233—Sediment Transport II (2) Prereq: ECI 6237 or consent of instructor. Review of fundamental laws of scour initiation and sediment transport. River morphology. Movable bed hydraulic models.

ECI 6234—Hydraulics of Stratified Flow (2) Prereq: ECI 5235 or consent of instructor. Uniform and nonuniform flow in multilayered systems. Oscillatory motion and interfacial mixing.

ECI 6237—Sediment Transport I (2) Prereq: ECI 5235 or consent of instructor. Sediment properties. Scour initiation. Influence of slope. Stable channels. Bed forms. Transport as bed load and suspended transport.

ECI 6238—Transient Flow in Channels and Pipes (3) Prereq: ECI 5235 or consent of instructor. Water hammers in singular pipes and systems. Governing differential equations. Numerical methods. Unsteady open channel flow equations.

ECI 6316—Advanced Soil Mechanics (3) Prereq: ECI 4305, 4314, or consent of instructor. Nature and origin of soil. Stresses within a soil body. Stress-strain behavior and shear strength of dry, saturated no flow, and saturated transient flow soils.

ECI 6317—Theoretical Soil Mechanics (2) Prereq: consent of instructor. Nature of soil-water systems; analysis of stress, strains, equations of states; rheological behavior of soils; failure in soil media.

ECI 6346—Soil Dynamics (2) Dynamic principles; lumped systems; elastic half-space theory; soil behavior under dynamic loading; foundation design problems, earthquakes.

ECI 6416—Properties, Design and Control of Concrete (3) Prereq: ECI 3403. Portland cement and aggregate properties relating to design, control, and performance of concrete. Concrete forming and construction methods. Laboratory testing and analysis.

ECI 6426—Bituminous Materials (3) Prereq: TTE 4104. Analysis of strength and deformation mechanism for asphalt concrete, properties, and their effect on flexible pavement performance. Pavement construction and quality assurance methods, testing and evaluation of asphalts and mixture.

ECI 6436—Experimental Determination of Soil Properties II (3) Prereq: ECI 5437 or consent of instructor. Factors influencing stress-deformation response, elastic-plastic constitutive relationships, failure criteria, centrifugal modeling, stress path effects.

ECI 6576—Air Photo Interpretation: Terrain Analysis (3) Prereq: ECI 4314 or consent of instructor. Interpretive techniques used to identify landforms, soils, rocks, and potential engineering problems from aerial photography. Analysis for site selection and planning of soil exploration programs.

ECI 6605—Rock Mechanics and Engineering Geology (2) Prereq: ECI 4305. Behavior of rock subjected to stress. Application of rock mechanics and geology to the planning, design and construction of engineering structures.

ECI 6610—Groundwater Problems in Geotechnical Engineering (2) Prereq: ECI 4305, 4314 or consent of instructor. Darcy's law, coefficient of permeability, flow nets; seepage forces. Engineering applications—dewatering systems, slope stability, filter design, earth dams, drainage.

ECI 6616—Groundwater Flow II (2) Prereq: ECI 5625 or consent of instructor. Continuation of ECI 5625. Two and three-dimensional groundwater flow cases. Transient flow. Solute transport in porous media. Saltwater intrusion.

ECI 6645—Advanced Geotechnical Engineering I (4) Prereq: ECI 6316 or consent of instructor. Application of soil mechanics to the design and analysis of settlement and slope stability problems.

ECI 6646—Advanced Geotechnical Engineering II (4) Prereq: ECI 6316 or consent of instructor. Application of soil mechanics to the design and analysis of bearing capacity and earth pressure problems.

ECI 6905—Special Problems in Civil Engineering (1-6; max: 10) Studies in areas not covered by other graduate courses.

ECI 6910—Supervised Research (1-5)

ECI 6936—Graduate Civil Engineering Seminar (1; max: 2)

ECI 6940—Supervised Teaching (1-5)

ECI 6971—Research for Master's Thesis (1-15)

ECI 6974—Master of Engineering or Engineer Degree Report (1-6) Individual work culminating in a professional practice-

oriented report suitable for the requirements of the Master of Engineering or Engineer degree. Two credits only are applicable toward the requirements of each degree.

ECI 7980—Research for Doctoral Dissertation (1-15)

ENV 5625—Water Resources Engineering Design (3) Prereq: ECI 4214 or consent of instructor. Design oriented courses based on methods developed in ECI 4214. Introduction to water resources systems and management.

TTE 5006—Transportation Systems Planning (4) Prereq: graduate standing or consent of instructor. Analytical techniques for estimating future travel demands, planning, transportation facilities and locations. Review of transportation technology and future systems.

TTE 5105—Pavement Design (2) Prereq: TTE 4104 or consent of instructor. Design of flexible and concrete pavements.

TTE 5256—Traffic Engineering (4) Prereq: TTE 4007 or equivalent. Traffic studies, operations, flow, signals, signs and markings; regulation of traffic, pedestrian and bicycle operation, parking lot operations, highway lighting.

TTE 5701—Geometric Design of Transportation Facilities (3) Prereq: TTE 4104 or consent of instructor. Geometric design criteria and controls of highways and intersections.

TTE 6106—Soil Stabilization (2) Prereq: graduate standing or consent of instructor. Highway soil stabilization, methods of stabilization and behavior of materials.

TTE 6107—Highway Safety Analysis (2) Statistics and characteristics of accidents, accident reconstruction, accident causation and reduction.

TTE 6257—Traffic Control Systems (4) Prereq: TTE 5256. Traffic controller operation, computer controlled signal systems, modeling and optimization of traffic control systems, system selection implementation and management.

TTE 6267—Traffic Flow Theory (3) Prereq: TTE 5256. Operational techniques used to optimize traffic flow including control systems. Maintenance operations. Freeway operations and control. Intersection channelization.

TTE 6307—Freeway Design and Operations (3) Prereq: TTE 5256. Operation of freeway systems, effects of design, advanced analysis techniques, freeway optimization techniques.

TTE 6516—Transportation Planning Decisions (2) Prereq: ECI 4137 or equivalent. Decisions on public investment analysis methods, cost-benefit and delphi techniques, identification and assessment of physical, social, and economic impacts of transportation alternatives, costs of vehicle operations, accidents, value of time, safety, other factors.

TTE 6526—Airport Planning and Operations (2) Prereq: TTE 6257. Location, configuration, air connections; ground, baggage, and freight movements; passenger transfers; aircraft delay analysis; airport access; parking needs; simulation of operations; flight scheduling and control.

TTE 6606—Urban Transportation Models (4) Prereq: TTE 5006, ECI 4041 or consent of instructor. Calibration and application of UTPS computer models for urban transportation planning; land use and urban activity models for forecasting and allocation. H.

CLASSICS

College of Liberal Arts and Sciences

GRADUATE FACULTY 1980-81

Chairman: G. L. Schmeling. Professor: G. L. Schmeling. Associate Professors: S. K. Dickison; K. V. Hartigan; D. G. Miller; L. A. Sussman.

The department offers a program leading to the Master of Arts with a major in Latin, which may be combined with a minor in Greek, history, or philosophy.

LAT 6840—History of the Latin Language (3)

LNW 5905—Special Study in Latin (3)

LNW 6902—Special Study in Latin Literature (3; max: 9) Sample topics: Horace, Juvenal, Roman comedy, Roman historians.

LNW 6905—Individual Work (2-4; max: 10) Readings, conferences and reports. Subjects in language, literature, and civilization for which there are no special course offerings.

LNW 6910—Supervised Research (1-5)

LNW 6940—Supervised Teaching (1-5)

LNW 6971—Research for Master's Thesis (1-15)

CLINICAL PSYCHOLOGY

College of Health Related Professions

GRADUATE FACULTY 1980-81

Chairman: N. W. Perry, Jr. Graduate Coordinator; H. Davis. Professors: B. Barger; E. Cohen; L. D. Cohen; H. Davis; J. R. Goldman; K. M. Heilman; M. Hollower (Emeritus); F. D. McGlynn; W. L. Mealiea; B. G. Melamed; M. E. Meyer; N. W. Perry, Jr.; A. S. Schumacher (Emeritus). Associate Professors: C. D. Belar; R. K. Blashfield; M. K. Goldstein; R. K. Hornberger; J. H. Johnson; W. J. Rice; V. D. Van De Riet. Assistant Professors: D. Bowers; E. B. Fennell; S. B. Johnson; M. H. McCauley; J. Tucker; R. E. Vuchinich.

The Department of Clinical Psychology is a graduate program department in the College of Health Related Professions. The department's programs are its predoctoral clinical psychology program leading to the Ph.D. degree in psychology; the Psychology Clinic, a teaching and service unit of the J. Hillis Miller Health Center's Teaching Hospital and Clinics; a predoctoral internship program, and postdoctoral studies and research. The master's degree is offered as part of the doctoral program studies.

The clinical psychology program involves academic ties with other colleges and departments within the University and with the Veteran's Administration training and service programs.

Courses offered by the faculty of the department are listed below. Progress of the program is determined by departmental policies which are consistent with American Psychological Association accreditation standards.

Admission to the department is through appropriate application to the department's admissions committee. A bachelor's degree, along with one undergraduate course in both experimental psychology and statistics and courses in at least three of the following areas: developmental, learning, perception, personality, physiological and social, is generally adequate preparation for graduate admission.

CLP 6375—Introduction to Clinical Psychology (3) Prereq: admission to CLP program. Seminar on issues and concepts concurrent with field observation and participation.

CLP 6407—Psychological Treatment I (3) Prereq: admission to CLP program or consent of instructor. Current dynamic and personality theories, practices, and related research in psychotherapy.

CLP 6417—Psychological Treatment II (4) Prereq: admission to CLP program or consent of instructor. Current behavioral theories, practices, and related research.

CLP 6437—Behavioral Assessment (3) Prereq: admission to CLP program or consent of instructor. Research, theory, and basic procedures including observational and interview techniques.

CLP 6441—Intellectual Assessment (3) Prereq: admission to CLP program or consent of instructor. Research, theory, and basic procedures in assessing intellectual functions.

CLP 6448—Personality Assessment (3) Prereq: admission to CLP program or consent of instructor. Research, theory, and basic procedures including objective and projective techniques.

CLP 6449—Life History Research in Psychopathology (3) Prereq: CLP 6497 or consent of instructor. Recent and longitudinal developments in life history approaches to psychopathology and related behavioral disorders.

College of Liberal Arts and Sciences

GRADUATE FACULTY 1988-89
Chairman: G. L. Schmeling. Professor: G. L. Schmeling.
Associate Professors: S. K. Dickison; K. V. Hartigan; D.
C. Miller; L. A. Surman.

The department offers a program leading to the Master of Arts with a major in Latin, which may be combined with a minor in Greek, History, or philosophy.

1997-1998—History of the Latin Language (7)
 1998-1999—Special Study in Latin (3)
 1999-2000—Special Study in Latin Literature (7; min: 9) Sum-
 mable topics: Horace, Juvenal, Roman comedy, Roman His-
 tory
 2000-2001—Individual Work (2-4 min: 9) Readings, con-
 ferences and reports Subjects in language, literature, and
 civilization for which there are no special course offerings

CLINICAL PSYCHOLOGY
College of Health Related Professions

[illegible][illegible]

The clinical psychology program involves academic ties with other colleges and departments within the University and with the Veteran's Administration training and service programs.

Courses offered by the faculty of the department are listed below. Progress of the program is determined by departmental policies which are consistent with American Psychological Association accreditation.

Admission to the department is through appropriate application to the department's admissions Committee. A bachelor's degree, along with one undergraduate course in both experimental psychology and statistics and courses in at least three of the following: developmental, learning, perception, personality, physiological and social, is generally adequate preparation for graduate admission.

CLP 6575—Introduction to Clinical Psychology (3) Prereq: admission to CLP program. Seminars on issues and concepts concurrent with field observation and participation.

CLP 6585—Psychological Treatment I (3) Prereq: admission to CLP program or consent of instructor. Current dynamic and personality theories, practices, and related research in

CLIP 6617—Psychological Treatment II (4) Prereq: admission to CLIP program or consent of instructor. Current behavioral theories, practices, and related research.

CLIP 6637—Behavioral Assessment (3) Prereq: admission to CLIP program or consent of instructor. Research, theory, and basic procedures including observational and interview

CLIP 6641—Intellectual Assessment (3) Prereq: admission to CLIP program or consent of instructor. Research, theory, and basic procedures in assessing intellectual functions.

CIP 608—Personality Assessment (3) Prereq: admission to CIP program or consent of instructor. Research, theory, and basic procedures including objective and projective tech-

CLP 6499—Life History Research in Psychopathology (3)
Prereq: CLP 6497 or consent of instructor. Recent and longitudinal developments in life history approaches to psychopathology and related behavioral disorders.

CIB - W&S

Study of Construction Programmes

February 17th, 1981.

Name of Institution University of Illinois at Urbana-Champaign

Faculty/School Department of Civil Engineering
Address 208 North Main Street
Urbana, IL 61801

Name, Title of Contact John W. Mellin, Professor of Civil Engineering

Name, Title of Respondee John W. Mellin, Professor of Civil Engineering

Programme/s offered Degree Bachelor Degree Master Ph.D Non-deg. Certificate Part of Other
Specify

Year Programme Established Duration (years) - length of Programme 7 2 3+ -- -- --

Enrollment

Current Part Time 0 0 0 0 0 0 0

Current Full Time 35 13 9 0 0 0 0

Other (specify)

of which

National

Foreign

Admission Requirements

Course Requirements - list

number of courses needed

whether thesis or not

Scholarship, Fellowship

Bursaries, etc. available

Yes

Yes

Yes

Yes

Yes

Yes

Yes

Yes

Yes

Yes

Yes

Yes

Yes

Yes

Yes

Yes

Yes

Yes

Yes

Yes

Yes

Yes

Yes

Yes

Yes

Yes

Yes

Yes

Yes

Yes

Yes

COURSES, TITLES, DESCRIPTIONS:

CE 216 - Construction Engineering; Introduction to the construction processes: Contrasting and bonding, planning and scheduling, estimating and project control, scientific productivity models and construction econometrics.

CE 315 - Construction Productivity. Introduction to the application of scientific principles to the measurement and forecasting of productivity in construction engineering; conceptual and mathematical formulations of the labor, equipment, and material affecting productivity.

CE 316 - Construction Planning and Control. Project definition; scheduling and control; material, labor, and equipment allocation; optimal schedules; project organization documentation and reporting system; and management and control.

CE 318 - Construction Cost Analysis and Estimates. Introduction to the application of scientific principles to costs and estimates of costs in construction engineering concepts and statistical measurements of the factors involved in direct costs, overhead costs, cost markups and profits; and the fundamentals of cost recording construction cost accounts and cost controls.

CE 416 - Systems Analysis, I: Systems Methodology and Network Techniques. Basic concepts theories, and techniques of systems analysis, including modeling of large scale systems, forecasting, planning, control and information handling; emphasizes the modeling of systems with network techniques, including distance, flow and project networks; and discusses advanced network topics such as out-of-kilter algorithms and project resource analysis.

CE 417 - Systems Analysis, II: Digital Simulation. Application of simulation techniques systems analysis; includes modeling for simulation, design of simulation experiments, random number generation, process generation, simulation of queuing systems inventory systems, and project networks, analysis of simulation results and some digital simulation languages and programs in use, such as GASP II and GENTS III.

EDUCATIONAL PROGRAM OBJECTIVES:

The basic objective of our program is educating civil engineering students for careers in project management. The program equips the students with the theory and methodology of engineering and management, and conveys a deeper understanding of these tools in a professional working environment. The program attempts to simulate the professional environment using team projects on real structures. The students gather experience in organizing and interacting with their peers to achieve common goals on real projects, providing an extra dimension in learning, which complements and reinforces the basic theoretical course content.

RESEARCH Organizational (Applied) (x) Engineering (Hard) (x)

RESEARCH FUNDING:

NATURE/OBJECTIVES OF RESEARCH:

Analysis of Standards. This research involved the application of systematic analyses of decision tables and information networks to the provisions of standards, codes, and specifications. The analysis provides measures of the internal consistency, clarity, and completeness of a standard.

Fair and Reasonable Markup. In the construction industry, at the project level, markup traditionally has been computed as a percentage of the estimated total cost. The practice has led many to become "equal markup" contractors, or to use their subjective judgment in deciding what markup to use for a particular project. This research investigates a return on investment approach in determination of a fair and reasonable markup.

The Communication Process in the Construction Industry. The purpose of this study is to examine and analyze the communication process within a construction company.

A broad scheme of the context of communication, corresponding types of communication within each context, and primary influences on communication at each level is being investigated. Concentration is on the variables within the categories--communication, individual, and organization. The objective is to find means of improving communications and thus increase productivity in the construction industry.

An Approach to the Construction Equipment Policy. This research attempts to solve the utilization and acquisition problems in construction equipment management. A model is being developed to simulate the equipment cost and will be applied in the utilization policy-making. The relationship between acquisition and utilization policies will be investigated and the result used in the acquisition policy-making. A guideline for implementation of the approach is to be presented.

Risk Sharing in Construction Contracts. This study investigates the cost effects of varying the assignment of risk between owners and contractors in firm fixed-price construction contracts. Among the topics included are a risk classification system, techniques for contractually assigning risk, the applicability of utility theory for analyzing the assignment of risk in construction, modeling the cost effects of varying the assignment of risk, and implementation considerations.

RESEARCH FACILITIES:

Extensive computer and laboratory facilities.

SPECIAL FEATURES OF THE PROGRAM:

One of the special features of our program is construction movies which are shown each week. They give the student a chance to visit many sites all over the world and see construction in action.

Field trips to the offices of prominent design/contractor organizations, in Chicago. Also, to construction sites such as a nearby nuclear power plant.

Strong participation in and support of the student ASCE and AGC Chapters.

Name of Institution University of Michigan
Faculty/School Construction Engineering and Management
Address Department of Civil Engineering
Ann Arbor, Michigan 48109

Name, Title of Contact Professor Robert B. Harris
Name, Title of Responder Professor Robert B. Harris, Professor Robert I. Carr

Programme/s offered Degree Bachelor Degree Non-deg. Non-deg. Part of Other:
Bachelor Master Ph.D. Diploma Certificate Programme Specify

Year Programme Established 1949 1954 1954
Duration (years) - length of 4 1 3-5
Programme

Availability (Indicate current student nos) Part-time 50 45 3
Full-time
Other (specify)

National Year 45 12 3
Foreign 5 33

Admission Requirements 3.0/4.0 Exam.

Course Requirements - 128 hrs 30 hrs 25-30 hrs
Thesis Required No No Yes
Scholarship, Fellowship No Some Some
Bursaries, etc. available

Language of Instruction English
Total Numbers of Students Graduated

National 500 Foreign 200

Administration Scholarship Research

Funding: Government
(Indicate %) Industry
Other (specify)

Staff Numbers: Totals Faculty Full Time (3) Part time (2) Industry, Instructors, Speakers (-)
(Indicate %s)

Industry Input Financial Administrative (x) Curriculum Development x
(Please tick) Scholarship, Bursaries, etc(x) Overseeing Body Industry Liaison ()

Course, Titles, Descriptions
Indicate Text Title (if any)
1. Construction Contracting
2. Construction Engineering
3. Construction Safety Engineering and Management
4. Construction of Buildings
5. Construction Cost Engineering

(continued)

6. Construction Management and Methods Engineering
7. Excavation and Tunneling
8. Critical Path Methods
9. Project Networking Techniques
10. Construction Decisions Under Uncertainty
11. International Construction
12. Quality Control of Construction Materials
13. Bituminous and Cement Mixes for Constructed Facilities

Educational Programme Objectives: To prepare engineers to solve construction engineering and management problems with the rigorous approach common to other engineering disciplines.

Research (Please tick) Organizational (Applied) () Engineering (Hard) ()

Research Funding (Indicate source & amount (US \$))

Describe Nature/objectives of Research

Current research activities are in project scheduling, computer simulation of construction operations, project risk analysis, and construction cost engineering

Research Facilities

(Describe briefly if any) Construction Lab with plantables, micro computer, time lapse equipment
Major library and computer facilities
Civil Engineering Materials, Structures, Geotechnic, etc. Labs

Publications by Programme - only those that can be purchased (do not list articles in publications or out of print)

() Please check if interested in having above listed in National Technical Information Service for world wide distribution. (Separate instructions will follow on procedures for submittal).

February 17th, 1981.

Staff of Construction Programs

Course, Titles, Descriptions
Indicate Test Title (if any)
SEE ATTACHMENT

Name of Institution UNIVERSITY OF MINNESOTA - LINCOLN
Faculty/School CONSTRUCTION MANAGEMENT DEPARTMENT
Address 405 N. LINCOLN, NE 68505
Name, Title of Contact ROBERT E. ZILLY, DEPT. CHAIRMAN
Name, Title of Respondent
Program/s offered Degree Bachelor Master Ph.D Non-deg. Certificate Part of Other
Year Program Established 1966
Duration (years) - length 4 YR BS PROGRAM
Enrollment
Current Part Time
Current Full Time 229
Other (specify)
of which
National 218
Foreign 11
Admission Requirements OPEN

Course Requirements - list number of courses needed whether thesis or not
Scholarship, Fellowship, Bursaries, etc. available NONE FOR FINANCIAL STUDENTS, B-12 FOR SOON TAKING SL

Language of Instruction ENGLISH
Total Numbers of Students Graduated National 372 Foreign 18 To 11/81
Indicate % of funding by: Government 100 Industry 100 Other (specify)
Faculty Full Time (8) Part Time (1) Industry, Instructors ()
Speakers ()
Staff Numbers: Totals (Indicate #s)
Industry Input (Please tick)
Financial Administrative () Curriculum Development ()
Scholarship, Bursaries, etc. () Overseas Body Industry Liaison ()

Comments

ADMISSIONS REQUIREMENTS: REGULARLY REVIEWED WITH #3, 4, 5, 6, 7

Educational Programme Objectives:
SEE ATTACHMENT

Research (Please tick)
Research Funding (Indicate source & amount (US \$)) 25000 (MILKED)
Describe Nature/objectives of Research and
Research Facilities (if any)

Organizational (Applied) (✓) Engineering (Hard) ()

Are there any special features of your programme. Please indicate.
STRICT MANAGEMENT ORIENTATION

(7-1-79)

Brief Description of the B.S. Degree Program in
CONSTRUCTION MANAGEMENT

Offered by the
Department of Construction Management

College of Engineering
University of Nebraska, Lincoln, Nebraska 68588

The Construction Profession

Construction is a team process. Professionals in construction management have final responsibility for converting the designs of architects and engineers into physical reality. Qualified Constructors need a broad education in construction management and methods of operations. They must be leaders with competence in business and labor relations. Construction management involves planning, scheduling, and control of site work. It requires skill in methods of estimating, procurement, allocation, and coordination of resources necessary for the job. Constructors must be experts in construction materials, methods and equipment. They need a sound knowledge of structural design. They must be able to carefully interpret contract documents including specifications and working drawings, as well as have the ability to communicate clearly in words and sketches. They must understand how to apply computer methods in construction systems analysis and be capable of adapting other new techniques to this highly competitive field as they are developed.

In sum, the Constructor is a manager of men, machines and material within a time and money framework.

The Construction Management curriculum leads to a Bachelor of Science degree after four years of study. The program prepares you for a professional career in construction contracting or in many other areas closely related to the construction industry.

Admission to the University

Application--You should make your application for admission to the University at the earliest possible date, preferably before the semester preceding your expected enrollment. To obtain application materials and information regarding fees, regulations, etc., write or go to the Director of Admissions, Administration Building, Room 108, Lincoln, NE 68588.

Transfer from other accredited colleges requires individual evaluation. For information, write to the Department of Construction Management, W45 Nebraska Hall, Lincoln, NE 68588.

Entrance Requirements for Construction Management

The following high school units are required if the student is to enter the Construction Management curriculum without deficiencies:

1. 3½ units of mathematics, including 2 of algebra, 1 of geometry, and ½ of trigonometry
2. 3 units of English
3. 1 unit of physics

4. 4 optional units in academic subjects such as English, foreign languages, mathematics, natural sciences, and social sciences.

5. A total of 16 units are required for admission.

CONSTRUCTION MANAGEMENT (CM) CURRICULUM*
1978-1979

| Semester 1 | Credits | Semester 2 | Credits |
|--|---------|--|---------|
| CM 101-Const Communications I.....2 | | CM 102-Const Communications.....2 | |
| CM 111-Intro to Const Mgt I.....2 | | CM 132-Intro to Const Mgt II.....2 | |
| Physics 131 or 141-Gen Physics I.....5 | | CE 221-Surveying I.....3 | |
| Math 106-Anal Geom & Calc I.....14 | | CM 281-Comput & Anal Methods I.....3 | |
| | | Arch 308-Arch & Envir Studies.....1 | |
| | | Soc/Hum Electives.....3 | 16 |
| Semester 3 | | Semester 4 | |
| CM 241-Const Equip & Methods I.....3 | | CM 242-Const Equip & Methods II.....3 | |
| CM 282-Comput & Anal Methods II.....3 | | CM 302-Const Mtls & Spec II.....3 | |
| CM 301-Const Mtls & Spec I.....3 | | IE 203-Intro to Engrg Mgt.....3 | |
| Econ 210-Intro to Economics.....5 | | IE 220-Statics.....5 | |
| Ag Comm 200-Technical Writing.....17 | | Spch 311-Bus & Ind Communic.....3 | |
| | | Soc/Hum Elective.....3 | 17 |
| Semester 5 | | Semester 6 | |
| CM 305-Phys Env Systems I (HVAC).....3 | | CM 306-Phys Env Systems II (Elect).....3 | |
| CM 480-Work Anal & Simpl.....2 | | CM 478-Con Cost Anal I.....2 | |
| Acct 306-Survey of Account.....4 | | Fin 361-Finance.....4 | |
| EM 324-Strength of Matls.....3 | | Arch 410-Archit Struct I.....3 | |
| Soc/Hum Elective.....3 | | Soc/Hum or Tech Elective.....3 | |
| | | Tech Elective.....3 | 18 |
| Semester 7 | | Semester 8 | |
| CM 485-Con Mgmt Systems I.....3 | | CM 420-Professional Practice.....3 | |
| CM 479-Con Cost Anal II.....2 | | CM 481-Human Elements in Con.....2 | |
| CM 476-Con Cost Control.....3 | | CM 430-Contract Admin.....3 | |
| Arch 411-Arch Structures II.....3 | | Mgmt 482-Collective Bargaining.....3 | |
| Bus Law 372-Business Law.....3 | | Technical Electives.....3 | |
| Mgmt 360-Human Res. Mgmt.....3 | | | 17 |

Total Credit Hours Required: 134

*Of the 24 credit-hour total of electives, a minimum of 9 credit hours of humanistic-social and 9 credit hours of technical electives are required. At least 3 credit hours must be selected from CM 441, CM 460, and CM 486. The balance may be selected in either technical or soc/hum areas.

CONSTRUCTION MANAGEMENT
Course
Number

- 101 CONSTRUCTION COMMUNICATIONS I (2 cr)
Prereq: None, simultaneous registration in CM 131 preferred
Fundamentals of orthographic, isometric and perspective drawing; research and presentation techniques for construction industry report writing; interpretation of working drawings for construction projects.
- 102 CONSTRUCTION COMMUNICATIONS II (2 cr)
Prereq: CM 101 and 131
Review of drawing techniques employed by various design disciplines in the construction industry (schematics, plans, elevations, sections, and details); origin and processing of shop drawings; field sketches and drawings (forming, shoring, construction methodology); laboratory reports (soils, concrete, sealant, acoustic); communications during the construction process (change orders, extras, delays, punch lists, and allowances).
- 131 INTRODUCTION TO CONSTRUCTION MANAGEMENT I (2 cr)
Prereq: None, simultaneous registration in CM 101 preferred
An overview of the entire construction industry and an introduction to basic management principles and practices used in the control of manpower, materials, machinery and money in the production of the built-environment within a time framework.
- 132 INTRODUCTION TO CONSTRUCTION MANAGEMENT II (2 cr)
Prereq: CM 131 and 101
Continuation of Construction Management 131.
- 241 CONSTRUCTION EQUIPMENT AND METHODS I (3 cr)
Prereq: CM 101, 102, 131 and 132, 301 parallel, sophomore standing or permission.
A survey of construction equipment and methods from a management point of view. An analytical approach to the development of construction methodology for site, excavation, and foundation work involving safe and economical mixes of manpower and machinery. Includes functions and applications of earthmoving and excavation equipment as well as pile drivers.
- 242 CONSTRUCTION EQUIPMENT AND METHODS II (3 cr)
Prereq: CM 241 and 301; 302 parallel
Continuation of CM 241, with emphasis on the structure from grade to topping out. Functions and applications of material handling equipment from simple pulleys to large cranes. Methods of constructing concrete formwork in a variety of applications. Assembly and erection of steel, wood, precast concrete, and masonry structural elements. Material finishing methods and equipment.

CONSTRUCTION MANAGEMENT

Course
Number

- 281 COMPUTATION AND ANALYSIS METHODS I (3 cr)
Lect 3 - Prereq: Math 106
Selected topics in general mathematics and calculus as applied to construction management, architecture, planning and engineering problems. Introduction to computer applications.
- 282 COMPUTATION AND ANALYSIS METHODS II (3 cr)
Lect 3 - Prereq: Math 106
Application of statistical analysis and operations research techniques to construction management, architecture, planning and engineering problems. Probability applications to risk and competitive situations.
- 301 CONSTRUCTION MATERIALS AND SPECIFICATIONS I (3 cr)
Lect 3 Prereq: CM 101, 102, 131 and 132
Physical, mechanical, and aesthetic properties of soils, stone, concrete and clay products as they relate to in-service conditions and acceptability, either individually or in combination with other materials. Emphasis on proper methods of specification to achieve design and construction goals and meet zoning, code, and environmental requirements.
- 302 CONSTRUCTION MATERIALS AND SPECIFICATIONS II (3 cr)
Lect 3 - Prereq: CM 301
Continuation of Construction Management 301 for wood, metals, gypsum, glass, plastics, and other construction materials and component products.
- 305 PHYSICAL ENVIRONMENTAL SYSTEMS I (3 cr)
Lect 3 - Prereq: CM 281 and Physics 131 or 141
Thermal and psychometric environment in buildings related to human comfort. Emphasis on HVAC loads; heat loss-gain, ventilation and humidity calculations. Characteristics and performance of HVAC systems. Review code requirements for mechanical equipment and systems.
- 306 PHYSICAL ENVIRONMENTAL SYSTEMS II (3 cr)
Lect 3 - Prereq: CM 281 and Physics 131 or 141
Fundamentals of electric power; generation, distribution, service and circuits in buildings. Electric equipment and systems. Review National Electric Code.
- 398 PROBLEMS IN CONSTRUCTION (1-6 cr)
Prereq: Permission of Chairman
Individual or group investigations of special problems in construction.

420/820

PROFESSIONAL PRACTICE

Prereq: Senior or graduate standing (2 cr undergrad, 3 cr grad)
Orientation to professional practice through a study of the designers' and the contractors' relationships to society, specific

CONSTRUCTION MANAGEMENT
Course
Number

clients, other professions, and other collaborators in environmental design and construction fields. Emphasis is placed on ethics, professional communication and responsibility, professional organization, office management, construction management, professional registration, and owner-designer-contractor relationships.

430 CONTRACT ADMINISTRATION (3 cr)

Prereq: Senior standing or permission
A study of construction industry business organization forms and their interaction through agency and independent contractor relationships. Analysis of the contract documents to define their basic elements and how they are applied in the construction industry.

441/841

INDUSTRIALIZED SYSTEMS BUILDING (3 cr)

Lect 3 - Prereq: Senior standing
Historical background of industrialized systems building; its economic and social relevance in modern society; and its influence on the traditional role of the contractor within the construction industry. Changes industrialized systems building will impose on the contractor's approach to finance, management, and construction methods and equipment.

460 CONSTRUCTION DATA MANAGEMENT SYSTEMS (3 cr)

Prereq: Senior standing or permission
A survey of selected data management systems as related to the construction industry. Topics include: estimating, scheduling, project management, accounting.

476

CONSTRUCTION COST CONTROLS (3 cr)

Prereq: Acctg. 306 or 103 & 104
Development of cost accounting principles and financial controls appropriate for construction contractors. Includes purchasing policies and procedures, labor and equipment cost reporting techniques, accounting procedures for control of materials and supplies, billing methods, principles of financial reporting and analysis.

478

CONSTRUCTION COST ANALYSIS (3 cr)

Prereq: CM 102, 132, 242, and 302
Detailed cost estimating based upon take-off from contract documents, labor, overhead, and profits. Analysis pertaining to building, heavy and industrial construction. Subcontractor relationships. Assembly of bid proposals.

479

CONSTRUCTION COST ANALYSIS II (2 cr)

Lect 1, Lab 2. Prereq: CM 478
Continuation of CM 478 with emphasis on detailed analysis of possible alternative solutions to specific construction problems.

CONSTRUCTION MANAGEMENT
Course
Number

Alternates will be evaluated in relation to their influence on manpower, machinery and money requirements within the overall time framework of the project.

480/880

CONSTRUCTION WORK ANALYSIS AND SIMPLIFICATION (2 cr undergrad, 3 cr grad)

Prereq: CM 241 & 242
Productivity consideration in the management of construction workers. Concepts of preplanning, work sampling, methods analysis, and work simplification applied to on-site construction projects. The interrelation of safety and productivity in project management.

481

HUMAN FACTORS IN CONSTRUCTION (2 cr)

Prereq: Senior standing or permission; Mgmt. 360
Human factors that influence productivity in construction. Motivations of tradesmen, foremen and superintendents will be discussed in terms of their typical job environments. Potential ways of influencing productivity and safety will be evaluated.

485/885

CONSTRUCTION MANAGEMENT SYSTEMS I (3 cr)

Prereq: CM 302, 242, and 282 (or approval of instructor for non-Construction Management majors)
Application of network analogy, critical path method (CPM), program evaluation review technique (PERT), precedence diagramming and analog charts to planning, resource scheduling, and control of projects. Systems solution by manual calculation and digital computer methods.

486/886

CONSTRUCTION MANAGEMENT SYSTEMS II (3 cr)

Prereq: CM 282 (or equivalent background in calculus, statistics, and computer science)
Application of selected topics in systems analysis (operations research) to construction management: competition strategy, linear programming, queuing, transportation, time-cost trade-off, learning curves, and other models. Computer applications.

ACCOUNTING AND BUSINESS LAW

306

SURVEY OF ACCOUNTING (4 cr)

Prereq: Junior standing
A one-semester course designed for students above the sophomore level who desire a knowledge of the fundamentals of accounting. Develops those fundamentals of accounting analysis which are most helpful in understanding managerial and business concepts and practices.

- 372 BUSINESS LAW (3 cr)
Prereq: Junior standing and Econ 210 or 211
Agency: creation; powers; termination; duties and liabilities of principal and agent. Negotiable instruments: elements of negotiability; endorsements and transfer; liability of parties; presentment, notice and protest; discharge. Business organizations: partnerships; corporations--organization, stockholders, directors, dissolution; business trusts.

AGRICULTURAL COMMUNICATIONS

- 200 TECHNICAL WRITING (3 cr)
Prereq: Sophomore standing
The basic techniques used in technical writing. Emphasis on writing, analyzing, and evaluating technical and scientific information.

ARCHITECTURE

- 308 ARCHITECTURE AND ENVIRONMENTAL STUDIES (3 cr)
Lect 3 - Prereq: Junior standing (waived for CM)
Background and development of architecture and environmental design. Forces influencing the development of our physical surroundings. Not open to majors in architecture.

- 410 ARCHITECTURAL STRUCTURES I (3 cr)
Prereq: EM 220 and 324
Analysis and design of structural members in wood, steel, and concrete with emphasis on columns, walls, footings, soils, trusses, and construction. Comparative building designs.

- 411 ARCHITECTURAL STRUCTURES II (3 cr)
Prereq: Arch 410
Analysis and design of structural members in wood, steel, and concrete with emphasis on columns, walls, footings, soils, trusses, and construction. Comparative building designs.

CIVIL ENGINEERING

- 221 SURVEYING (3 cr)
Prereq: Math 101 and EM 111 (waived for CM)
Theory and practice of surveying: care, use and adjustment of surveying instruments; measurement of distance, direction, and elevation; analysis and computation of field data; systems of recording data.

ECONOMICS

- 210 INTRODUCTION TO ECONOMICS (5 cr)
Prereq: Sophomore standing and above
A study of the principles which govern the organization and behavior of the modern economic system. Topics covered include the nature of economics and the economic system; national income measurement and determination; money and the economic system; government and the economy; economic growth; the allocation of economic resources; the distribution of income; and the international economy.

ENGINEERING MECHANICS

- 220 STATICS (3 cr)
Prereq: Math 106
For students in Architecture and Construction Management. Fundamental concepts, equilibrium of force systems, analysis of simple frames and trusses. Centroid and moments of inertia, friction, shear and bending moment diagrams. Laboratory tests showing behavior of materials under tension and compression loading.

- 324 STRENGTH OF MATERIALS (3 cr)
Lect 3 - Prereq: EM 220 or 223
For students in Architecture and Construction Management. Stress and strain analysis in elastic materials. Use of properties of materials in the analysis and design of welded and riveted connections, statically determinate and indeterminate flexure members, columns. Combined stresses, axial, eccentric and torsional loading.

FINANCE

- 361 FINANCE (3 cr)
Prereq: Junior standing
Scope and content of the finance specialization; survey of the major theoretical issues, study of the financial instruments, analysis of the capital management problems and development of criteria for financial decision-making.

INDUSTRIAL AND MANAGEMENT SYSTEMS ENGINEERING

- 205 INTRODUCTION TO ENGINEERING MANAGEMENT (3 cr)
Prereq: Sophomore standing
An introduction to the quantitative approach to engineering decision-making as it operates within the complex organization of industry. Theory and structure of formal and informal organizations.

MANAGEMENT360 HUMAN RESOURCES MANAGEMENT (3 cr)

Prereq: Junior standing
A study of the human resources used in management. The course gives a historical perspective to the development of organizations, management practices, and the behavioral sciences. A basic understanding is given of individual and organizational characteristics and processes as they affect the management of human resources. Special topics include management and organization theory, motivational processes, leadership, decision making, selection, and employee development. Examples are discussed from business health care, educational, and government institutions.

462 COLLECTIVE BARGAINING (3 cr)

Prereq: Mgm 360 or Econ 381 or equivalent
An interdisciplinary approach to collective bargaining as an agreement-making and agreement-administering concept between labor and management. Utilizes theoretical analysis and research reports. Consideration is given to the analysis of principles of collective bargaining as well as the application of these principles through the actual negotiating of a labor-management contract.

MATHEMATICS106 ANALYTIC GEOMETRY AND CALCULUS (5 cr)

Prereq: Math 101 and 102 or equivalent high school preparation
Functions, limits, derivatives of algebraic functions, applications of differentiation, integrals, applications of integration.

PHYSICS131 (or141) ELEMENTARY GENERAL PHYSICS (5 cr)

Prereq: 1 yr each of high school algebra and plane geometry
Mechanics, heat, electromagnetism.

SPEECH311 BUSINESS AND INDUSTRIAL COMMUNICATION (3 cr)

Prereq: Sophomore standing
The basic objective of this course is to provide students with a variety of theoretical and verbal communication approaches that are intended to help them achieve maximum effectiveness in their day-to-day relations with "people at work." Specifically, the course focuses on: developing interpersonal relationships and competency; interviewing techniques; oral report/technical presentation techniques; small group problem solving/leadership; organizational communication.

February 1/1th, 1981.

Society of Construction Programmes

Name of Institution University of Wisconsin
 Faculty/School 460 Henry Hall
 address Madison, WI 53706
 Name, Title of Contact Dick J. Stith, Professor, Construction Administration Advisor
 Name, Title of Responder Same as Contact
 Programme/s offered Degree Bachelor Degree Master Ph.D Non-deg. Diploma Certificate Programme Other
 Part of

Year Programme Established 1944
 Duration (years) - length 4 years
 of Programme
 Enrollment 160
 Current Part Time 5
 Current Full Time 155
 Other (specify)
 of which
 National USA
 Foreign
 Admission Requirements 24 semester credits completed, including 5 credits of Calculus and
 G.P.A. of 2.25.
 Course Requirements - list number of courses needed whether thesis or not 130 semester credits.
 No thesis.
 Scholarship, Fellowship Bursaries, etc. available Yes

Language of Instruction English
 Total Numbers of Students Graduated ? National 99.5% Foreign less than 0.5%
 Administration Scholarship Research
 100%
 Indicate % of funding by Government Industry Other (specify) College & gifts
 Faculty Full Time (1) Part Time (5) Industry, Instructors (3)
 Speakers
 Staff Numbers: Totals (Indicate #s)
 Industry Input Financial Administrative () Curriculum Development (X)
 (Please tick) Scholarship, Bursaries etc. (X) Overseeing Body Industry Liaison ()

Comments

Course, Titles, Descriptions
 Indicate Text Title (if any)

Of the 130 semester credits required for B.S. Construction Administration, 19 are taught in Major Department, 19 by School of Business. Other courses are offered in the Departments of Civil Engineering, Forestry, College of Agricultural and Life Sciences, and College of Letters and Science.

Educational Programme Objectives:

Prepare students for some phase in the building construction industry as constructors rather than for engineering design. The emphasis of the curriculum is toward the business of construction.

Research (Please tick) Organizational (Applied) () Engineering (Hard) ()

Research Funding
 (Indicate source & amount (US \$))

Describe Nature/objectives of Research Research not usually required at undergraduate level.
 and

Research Facilities (if any) U. S. Forest Products Laboratory, Madison, WI

Are there any special features of your programme. Please indicate.

Up to 8 semester credits of coordinated internship credits available for full-time construction industry employment.

February 17th, 1981.

Name of Institution Department of Civil & Environmental Engineering
 Faculty/School University of Wisconsin-Madison
 address 1415 Johnson Drive
 Madison, WI 53706

Name, Title of Contact Dr. Edward Kuipers, Professor
 Name, Title of Respondee Dr. Edward Kuipers, Professor

| Programme/s offered | Degree | Degree | Non-deg. | Part of | Other |
|---------------------|------------|--------|----------------|---------|-------------|
| | X Bachelor | Master | X Ph.D | Diploma | Certificate |
| | 4 | 1 | 3 ⁺ | | |

Year Programme Established Duration (years) - length of Programme

Enrollment

Current Part Time Unknown - -
 Current Full Time Unknown 2 1
 Other (specify) - - -
 of which

National - 1 -
 Foreign - 1 1

Admission Requirements

Course Requirements - list number of courses needed whether thesis or not

Scholarship, Fellowship Bursaries, etc. available

Language of Instruction English

Total Numbers of Students Graduated

Indicate % of funding by Government

Industry
 Other (specify)

Staff Numbers: Totals (Indicate #s)

Industry Input (Please tick)

Comments

Course, Titles, Descriptions
 Indicate Text Title (if any)

CZE 491: Legal Aspects of Engineering
 CZE 492: Estimates and Costs
 CZE 493: Economic Selection
 CZE 494: Civil and Environmental Decision Making
 CZE 495: Civil and Environmental Systems and Modelling Techniques
 CZE 590: Critical Path Network Techniques
 CZE 647(a): Planning and Design of Construction Operations
 (b): Estimating Systems and Bidding Models
 (c): Advanced Project Management
 CZE 593: Civil Engineering Construction Equipment and Methods
 CZE 594: Building Construction Systems
 Bus 550: The Real Estate Development Process (Grad St. take Bus. 705)
 Bus 559: Construction Enterprise Management

Educational Programme Objectives:

To provide engineering education for students interested in the construction industry and to provide an environment for classroom, laboratory, and individual research oriented education.

Research (Please tick)

Organizational (Applied) (X) Engineering () (X)

Research Funding

(Indicate source & amount (US \$))

Describe Nature/objectives Construction Productivity, Systems Modelling of Research in Construction, Life Cycle Cost of Construction Mat'ls.

and

Research Facilities (if any) Construction Materials Laboratories, a wide range of state-of-the-art computer facilities.

Are there any special features of your programme. Please indicate.

By design, all levels of our curriculum are designed with a maximum of flexibility to allow the student to concentrate his personalized study program in his selected area of interest.

February 17th, 1981.

Study of Construction Programmes

Name of Institution University of Wisconsin-Platteville

Faculty/School Dr. Alva H. Jared, Chairman Department of Industrial Studies
College of Business, Industry and Communication
University of Wisconsin-Platteville, WI 53188

Name, Title of Contact Dr. A. H. Jared, Chairman Department of Industrial Studies
Name, Title of Responder D. H. Stuelke, Assistant Professor
Building Construction

Programme/s offered Bachelor Degree Master Ph.D Degree Non-deg. Non-deg. Part of Other
Certificate Programme Specify

Year Programme Established 1970
Duration (years) - length Full Time - 85 students
of Programme

Enrollment
Current Part Time
Current Full Time
Other (specify)
of which
National
Foreign

Admission Requirements Meet general university entrance requirements

Course Requirements - list
number of courses needed
whether thesis or not

Scholarship, Fellowship \$600 Fish Building & Supply
Bursaries, etc. available \$100 United Building Centers
\$100 Eastern Carwright Lumber Inc. other local/state/national
and trade association monies available

Language of Instruction

Total Numbers of Students Graduated National 146 Foreign 1
Administration Scholarship Research
Indicate % of funding by Government (State supported institution)
Industry
Other (specify)

Staff Numbers: Totals Faculty Full Time 03 Part Time 00 Industry, Instructors 00
(Indicate #s) Speakers

Industry Input Financial Administrative Curriculum Development
(Please tick) Scholarship, Bursaries etc. 00 Overseeing Body Industry Liaison

Comments

Course, Titles, Descriptions
Indicate Text Title (if any)

Gen. Constr. Core Required
111 Intro. to Industry
113 Woodworking
243 Construction Materials & Graphics
271 Anal. of Industrial Safety
321 Construction Laboratory
322 Construction Procedures
413 Gen. Constr. Estimating
499 Industrial Internship
Construction Design Area of Emphasis

212 Construction Design
254 Mat'l & Tech. of Bldg. Const.
453 Res. Planning & Design
463 Housing Systems Analysis
473 Housing Synthesis
496 Commercial Bldg. Design &
Construction Techniques

Construction Supervision
Area of Thesis Sampling of Course
263 Intro. to Marketing
294 Industrial Train. Methods
303 Personnel Administration
310 Wage & Salary Adminis.
312 Construction Proj. Analysis
396 Prin. of Tech. Sales
484 Construction Administration
495 Product Plan. and Control

General university requirements
(43 cr.) including math, english,
science, social studies, and
humanities.

Educational Programme Objectives: Students at the UW-Platteville majoring in building construction get a solid background in building construction theory and practice, mathematics, physical and social sciences, communication skills, business, economics and human relations. This broad preparation enables a graduate to core with the wide range of construction activities and problems confronting the building construction industry.

Research (Please tick) Organizational (Applied) () Engineering (Hard) ()

Research Funding (Indicate source & amount (US \$))
NONE

Describe Nature/objectives
of Research
and

Research Facilities (if any)

Are there any special features of your programme. Please indicate.

Internships: All building construction majors must intern with a construction company or agency, earning 2-8 credits while setting on-the-job experience. This cooperative education program has several advantages: students receive both financial compensation and course credit for the work and at the same time gain the practical knowledge and understanding of building construction that many employers seek.

CIB - W65

Study of Construction Programmes

Name of Institution CIVIL ENGINEERING INDUSTRY TRAINING BOARD

Faculty/School PRIVATE BAG 1 GARDENVIEW 2047
address REPUBLIC OF SOUTH AFRICA

Name, Title of Contact MR. R.G. SPARKMANOS

Name, Title of Respondent DIRECTOR OF TRAINING

Programme/s offered Degree Bachelor Degree Master Ph.D Diploma Certificate Programme Specif

Year Programme Established
Duration (years) - length
of Programme

1980
1 week

Enrollment

Current Part Time

Current Full Time

Other (specify) ± 25 per course
of which

National

Foreign

Admission Requirements

Course Requirements - List
number of courses needed
whether thesis or not

Scholarship, Fellowship
Bursaries, etc.available

CONSTRUCTION EXPERIENCE AT SITE MANAGEMENT LEVEL -
BETWEEN 2 TO 5 YEARS.

Language of Instruction

Total Numbers of Students Graduated

National

Foreign

Administration

Scholarship

Research

Indicate % of funding by

Government

Industry

100%

Other(specify)

Staff Numbers: Totals
(Indicate #s)

Faculty Full Time () Part Time (2) Industry,Instructors (8)
Speakers

Industry Input
(Please tick)

Financial Administrative (X) Curriculum Development ()
Scholarship,Bursaries etc.() Overseas Body Industry Liaison (X)

Comments

- 2 -

Course, Titles, Descriptions
Indicate Text Title (if any)

1. METHOD STUDY
2. PROJECT PLANNING AND RESOURCE MANAGEMENT
3. THE CONTRACT (LEGAL ASPECTS)
4. COSTING AND ACCOUNTING
5. EARTHMOVING METHODS AND EQUIPMENT.

Educational Programme Objectives:

THESE COURSES ARE AN INTRODUCTION TO THE
CONSTRUCTION MANAGEMENT PROGRAMME.

Research (Please tick)

Organizational (Applied) () Engineering (Hard) ()

Research Funding
(Indicate source & amount (US \$))

Describe Nature/objectives
of Research

and
Research Facilities (if any)

Are there any special features of your programme. Please indicate.

February 17th, 1981.

CIB - 485
Study of Construction Programmes

Name of Institution UNIVERSITY OF CAPE TOWN

Faculty/School PRIVATE BAG, RONDEBOSCH. 7700. CAPE TOWN. REPUBLIC OF S.A.
address

Name, Title of Contact DR. M. VORSTER
Name, Title of Respondee CO-ORDINATOR

| Programme/s offered | Degree Bachelor | Degree Master | Degree Ph.D | Non-deg. Diploma | Non-deg. Certificate | Part of Programme | Other Specif |
|---------------------|-----------------|---------------|-------------|------------------|----------------------|-------------------|--------------|
| | | | | | | | |

Year Programme Established
Duration (years) - length
of Programme

Enrollment

Current Part Time

Current Full Time

Other (specify)
of which

National

Foreign

Admission Requirements

Course Requirements - list
number of courses needed
whether thesis or not

Scholarship, Fellowship
Bursaries, etc. available

Language of Instruction

Total Numbers of Students Graduated
Attended since 1978.

Indicate % of funding by
Government
Industry
Other (specify)

Staff Numbers: Totals
(Indicate #s)

Industry Input
(Please tick)

Comments

Course, Titles, Descriptions
Indicate Text Title (if any)

THE CONSTRUCTION MANAGEMENT PROGRAMME COVERS:

1. FINANCIAL MANAGEMENT.
2. ENGINEERING ECONOMY.
3. CONSTRUCTION MANAGEMENT.
4. OPERATIONS ANALYSIS.
5. THE ARCHITECT AND ENGINEER.
6. RESPONSIBILITY ACCOUNTING.
7. HUMAN RELATIONS AND ORGANISATIONAL BEHAVIOUR.
8. MARKETING.
9. PROJECT MANAGEMENT TECHNIQUES.
10. PROJECT EVALUATION.
11. EQUIPMENT MANAGEMENT.
12. INDUSTRIAL RELATIONS.
13. QUALITY ASSURANCE.
14. CONTRACT LAW.
15. MEASUREMENT & VALUATION.
16. WEST GATE BRIDGE.

Educational Programme Objectives:

Research (Please tick) Organizational (Applied) () Engineering (Hard) ()

Research Funding
(Indicate source & amount (US \$))

Describe Nature/objectives
of Research
and

Research Facilities (if any)

Are there any special features of your programme. Please indicate.

C13 - 1465
Study of Construction Programmes

February 17th, 1981.

Name of Institution UNIVERSITY OF PRETORIA

Faculty/School address PRETORIA, 0002, REPUBLIC OF SOUTH AFRICA.

Name, Title of Contact PROFESSOR F. FOURIE.
Name, Title of Respondee CO-ORDINATOR.

Programme/s offered Bachelor Degree Non-deg. Part of Other
Master Ph.D Diploma Certificate Programme Specif

Year Programme Established
Duration (years) - length
of Programme

1980 CHP
6 weeks

Enrollment
Current Part Time
Current Full Time
Other (specify)
of which

1980

12

National Foreign
PRETORIA

Admission Requirements GRADUATE WITH + FIVE YEARS EXPERIENCE.

Course Requirements - list
number of courses needed
whether thesis or not

Scholarship, Fellowship
Bursaries, etc. available

Language of Instruction

Total Numbers of Students Graduated -
Attended since 1978.

National 32 Foreign

Administration Scholarship Research

Indicate 2 of funding by Government

Industry

Other (specify)

Staff Numbers: Totals
(Indicate #s)
Faculty Full Time () Part Time (2) Industry, Instructors (8)
Speakers

Industry Input
(Please tick)
Financial Administrative () Curriculum Development ()
Scholarship, Bursaries etc. () Overseas Body Industry Liaison ()

Comments

Course, Titles, Descriptions
Indicate Text Title (if any)

THE CONSTRUCTION MANAGEMENT PROGRAMME COVERS:

1. OPERATIONS ANALYSIS.
2. MANAGEMENT ACCOUNTING AND FINANCE.
3. PERSONAL ORGANISATION AND THE CONDUCT OF MEETINGS.
4. PROJECT PLANNING AND CONTROL.
5. HUMAN FACTORS.
6. ENGINEERING ECONOMY.
7. QUANTITATIVE METHODS IN CONSTRUCTION.
8. CONSTRUCTION PLANT.
9. CONTRACT LAW.
10. MANPOWER PLANNING AND UTILISATION.
11. MARKETING OF ENGINEERING PROJECTS AND SERVICES.
12. WESTGATE BRIDGE.

Educational Programme Objectives:

Research (Please tick) Organizational (Applied) () Engineering (Part) ()

Research Funding
(Indicate source & amount (US \$))

Describe Nature/objectives
of Research

and

Research Facilities (if any)

Are there any special features of your programme. Please indicate.

C18 - 465

Study of Construction Programmes

February 17th, 1981.

Name of Institution UNIVERSITY OF PRETORIA

Faculty/School PROJECT AND CONSTRUCTION MANAGEMENT DESIGN DEPARTMENT
address OF CIVIL ENGINEERING, UNIVERSITY OF PRETORIA, PRETORIA, SOUTH AFRICAName, Title of Contact
Name, Title of Respondent PROF F FOURIE

Programme/s offered Degree Bachelor Degree Master Ph.D. Non-deg. Diploma Certificate Programme Specify Part of Programme

Year Programme Established Duration (years) - length of Programme 1976 6 weeks

Enrollment

Current Part Time

Current Full Time

Other (specify) of which

National

Foreign

Admission Requirements

Course Requirements - list number of courses needed whether thesis or not

Scholarship, Fellowship

Bursaries, etc. available

Language of Instruction ENGLISH

Total Numbers of Students Graduated

National 94

Foreign 36

Indicate % of funding by Government

Industry

Other (specify)

Faculty Full Time (2) Part Time (4) Industry, Instructors (8) Speakers

Staff Numbers: Totals (Indicate #s)

Industry Input (Please tick)

Financial Administrative (✓) Curriculum Development (✓) Scholarship, Bursaries etc. (✓) Overseas Body Industry Liaison (✓)

Comments

Course, Titles, Descriptions (From your brochure)
Indicate Text Title (if any)
Management Accounting and Finance
Engineering Economy
Contract Strategy
Project Management
Contract Law

Marketing of Construction and Engineering Services
Construction Plant
Project Planning and Scheduling
Quantitative Methods in Construction
Operations Analysis
Human Factors
Manpower Planning and Utilization
Personal Organization and the Conduct of Meetings
Process Negotiation

Educational Programme Objectives: - To provide professional management training to people in the construction industry who have that a purely technical background is not enough for their changing responsibilities

Research (Please tick)

Research Funding (Indicate source & amount (US \$))

Research (Please tick) Organizational (Applied) (✓) Engineering (Hard) ()

Describe Nature/objectives of Research and

Research Facilities (if any)

Are there any special features of your programme. Please indicate.

CIB - 1465
Study of Construction Programmes

February 17th, 1981.

Name of Institution UNIVERSITY OF PRETORIA

Faculty/School CONSTRUCTION MANAGEMENT DIVISION, DEPARTMENT OF CIVIL ENGINEERING
address UNIVERSITY OF PRETORIA, PRETORIA, SOUTH AFRICA

Name, Title of Contact Prof F Fourie

Name, Title of Respondent

Programme/s offered Degree Master Ph.D Diploma Certificate Programme Specify
Bachelor

Year Programme Established 1974
Duration (years) - length of Programme 3

Enrollment

Current Part Time 20

Current Full Time 5

Other (specify) of which

National 25

Foreign

Admission Requirements

Course Requirements - list number of courses needed whether thesis or not

Scholarship, Fellowship Bursaries, etc. available

From Industry

Language of Instruction 80% AFRIKAANS & 20% ENGLISH

Total Numbers of Students Graduated

National 32

Foreign

Indicate % of funding by

Government

Industry

Other (specify)

Administration

60

40

Scholarship

50

50

Staff Numbers: Totals (Indicate #s)

Faculty Full Time (3) Part Time (4) Industry, Instructors (7) Speakers

Industry Input (Please tick)

Financial Administrative (✓) Curriculum Development (✓) Scholarship, Bursaries etc. (✓) Overseeing Body Industry Liaison (✓)

Comments

- 2 -

Course, Titles, Descriptions Indicate Text Title (if any)

1. PROJECT PLANNING

2. PROJECT ADMINISTRATION

3. PROJECT ACCOUNTING & FINANCING

4. CONSTRUCTION EQUIPMENT

5. CONSTRUCTION CONTRACT LAW

6. PERSONAL MANAGEMENT

7. OPERATIONS ANALYSIS

8. NETWORKING TECHNIQUES

Educational Programme Objectives: To educate better project and construction managers for industry

Research (Please tick)

Organizational (Applied) (✓) Engineering (Hard) (✓)

Research Funding

(Indicate source & amount (US \$))

Industry \$20,000 per year

Government \$10,000 per year

Describe Nature/objectives of Research

Monthly development work

and

Research Facilities (if any)

Computers & Two laptop equipment

Are there any special features of your programme. Please indicate.

CIB - 1453
Study of Construction Programmes

February 17th, 1981.

Name of Institution Technion, Israel Institute of Technology

Faculty/School Department of Civil Engineering
address

Name, Title of Contact Prof. S. Peor
Name, Title of Respondent

Programme/s offered Degree Bachelor Master Ph.D Non-deg. Certificate Part of Other
Duration (years) - length 4 2 3 - - - - Specify

Year Programme Established 1964 1965 1970 - - - -
Duration (years) - length 4 2 3 - - - -
of Programme

Enrollment

Current Part Time 30 3

Current Full Time 200 16 8

Other (specify)
of which

National 200 46 9

Foreign - - 2

Admission Requirements Matric. B.Sc. M.Sc.

Course Requirements - list
number of courses needed
whether thesis or not

Scholarship, Fellowship 10 4

Bursaries, etc. available Yes Yes Yes

Language of Instruction Hebrew

Total Numbers of Students Graduated

National 65 Foreign 4

Administration Scholarship Research

Indicate % of funding by Government - - 90

Industry - 10 10

Other (specify) - 20 -

Staff Numbers: Totals Faculty Full Time (3) Part Time (6) Industry, Instructors (4)
(Indicate %s) Speakers

Industry Input Financial Administrative () Curriculum Development ()
(Please tick) Scholarship, Bursaries etc. () Overseeing Body Industry Liaison ()

Comments

- 2 -

Course, Titles, Descriptions
Indicate Text Title (if any)

Advanced Statistics

Operations Research

Engineering Economics I and II

Construction Management I and II

Industrialised Building Systems

Building Equipment and Formwork

Managerial Decision Making

Legal Problems in Construction

Special Problems in Construction Management

Financial Planning and Control

Educational Programme Objectives:

Advanced studies in Construction Management.

Research (Please tick)

Organisational (Applied) (✓) Engineering (Hard) (✓)

Research Funding

(Indicate source & amount (US \$))

~ 300000 per year

Describe Nature/objectives
of Research

Basic and applied research

and

Research Facilities (if any)

Computer support; time study equipment

Are there any special features of your programme. Please indicate.

February 17th, 1981.

Study of Construction Programmes

| | |
|---|--|
| Name of Institution | Musashi Institute of Technology |
| Faculty/School address | Department of Architecture, Faculty of Engineering 1-28-1 Tamazutsumi, Setagaya-ku, Tokyo, Japan |
| Name, Title of Contact | Tadashi Eguchi, Professor |
| Name, Title of Responder | o Degree o Degree Non-deg. Part of Bachelor Master Ph.D Diploma Certificate Programme Spec |
| Programme/s offered | |
| Year Programme Established | 1929 (the year Department of Architecture established) |
| Duration (years) - length of Programme | |
| Enrollment | note: The Institute has only one faculty comprising six departments. The Department of Civil Engineering has nearly the same number of students. The total students number of six departments is about 4,000. The total of post-graduate is about 100. |
| Current Part Time | Students of Dept. of Architecture |
| Current Full Time | 521 (total of 4 grades) |
| Other (specify) of which | 20 (post-graduate) |
| National Foreign | almost all very few |
| Admission Requirements | |
| Course Requirements - list number of courses needed whether thesis or not | 131 units (about 50 courses including general culture and foreign languages courses etc.) a lecture course of 90 minutes a week for a year is equivalent three "units". |
| Scholarship, Fellowship Bursaries, etc. available | Japan Educational Association's Scholarship (Government funds) and some private scholarship of small amounts. |
| Language of Instruction | Japanese |
| Total Numbers of Students Graduated | National 3,813 (Post-graduate 63) Foreign |
| Indicate % of funding by | Administration Scholarship Research |
| | Government Industry Other(specify) |
| Staff Numbers: Totals (Indicate \$'s) | Faculty Full Time (14) Part Time () Industry,Instructors (20) Speakers |
| Industry Input (Please tick) | Financial Administrative () Curriculum Development () Scholarship,Bursaries etc.() Overseas Body Industry Liaison (V) |
| Comments | The above is about the Department of Architecture which has four major groups of courses. Separately, the Department of Civil Engineering in the Institute also includes some courses related to construction. |

Course, Titles, Descriptions Students are required to learn 82 units (about 30 courses indicate text title (if any) from the following during four years.

Major groups

Architectural design: 17 courses (43.5 units)

- History of Oriental Architecture
- Architectural Planning (1)-(3)
- Urban Planning
- Building Industry
- Building Information

Building structural engineering: 7 courses (22 units)

- Building Structural Dynamics (1)(2)
- Planning of Building Structure
- Building Seismic Engineering
- Building Structural Engineering Exercises

Building Materials and Construction: 6 courses (19 units)

- Building Materials and Construction Methods (1)(2)(3)
- Planning of building construction methods
- Building Construction Practices

Exercises for Building Materials and Construction Methods

Building Environment Engineering: 5 courses (14.5 units)

- Building Environment Engineering
- Building Equipments (1)(2)(3)

Common courses:

- Exercises for Building Environment and Equipments
- Building Experiments
- Graduate Thesis

Related courses

- Aesthetics
- Industrial Engineering
- Field Surveying
- Applied Mathematics
- Ergonomics
- Electronic Computer Application
- Analysis (Mathematics)
- Data Processing
- etc.

Research (Please tick)

Organizational (Applied) () Engineering (Hard) (V)

Research Funding (Indicate source & amount (US \$))

Describe Nature/objectives of Research and

Research Facilities (if any)

Are there any special features of your programme. Please indicate.

The Department of Architecture belongs to The Faculty of Engineering. This is usual in Japan. Research on organization and management of construction is not popular in Department of Architecture nor in Department of Civil Engineering. Researches on engineering (hard) and design are popular in the both Departments.

February 17th, 1981.

Name of Institution Kyoto University
 Faculty/School Dept. of Civil Engineering
 Address Faculty of Engineering
 Yoshida-Honmachi, Sakyo-ku, Kyoto, 606, Japan
 Name, Title of Contact Kazuhiro Yoshikawa Professor, Dr. of Eng.
 Name, Title of Respondee

Programme/s offered Degree Bachelor Degree Master Ph.D Non-deg. Diploma Certificate Programme Part of Other
 Duration (years) - length of Programme 4 years 2 years 3 years 10 hr/yr 30 hr/yr

Year Programme Established 120/yr 60/yr 5/yr In total of dept. of Civil Eng.
 Duration (years) - length of Programme () (10/yr) (0/yr) (construction programme)

Enrollment

Current Part Time

Current Full Time

Other (specify)

National

Foreign

Admission Requirements

Course Requirements - list

number of courses needed

whether thesis or not

Scholarship, Fellowship

Bursaries, etc. available

Language of Instruction

Total Numbers of Students

Graduated

Indicate % of funding by

Government

Industry

Other (specify)

Faculty Full Time

(4) Part Time

(5) Industry, Instructors

(2)

Speakers

Industry Input

(Please tick)

Financial Administrative

Curriculum Development

Scholarship, Bursaries etc.

(overseeing Body Industry Liaison)

Comments

Undergraduate course is not divided into special programme or course

such as construction one

Course, Titles, Descriptions
 Indicate Text Title (if any)

construction planning
 construction engineering

related courses

survey

theory of planning in civil engineering systems and exercise
 administration of public works
 construction engineering adv.
 construction machinery

Educational Programme Objectives:

principle and concept of construction management
 technology and techniques for construction management especially based on
 systems analysis

Research (Please tick)

Organizational (Apply) (✓) Engineering (Hard) (✓)

Research Funding

(Indicate source & amount (US \$)
 about 10,000 us\$ per year
 from Ministry of Education

Describe Nature/objectives
 of Research

establish the construction management system

and

time-lapse camera set

portable video set

micro computer system (Sord M200 Mark II series,

color graphic display, digitizer etc.)

Research Facilities (if any)

Are there any special features in your programme? Please indicate.

Kyoto University is a unique university that has Construction Management
 Programmes.

We have close contact and liaison with construction industry

CLB - W65

Study of Construction Programmes

February 17th, 1981.

Name of Institution TAKENAKA KOMITEN CO., LTD., TECHNICAL RESEARCH LABORATORY.

Faculty/School address 5-14, 2-chome, MINAMISHINA, KOTO-KU, TOKYO, JAPAN.

Name, Title of Contact (Mr.) T. KANAIWA, Research Engineer.

Name, Title of Responder (Mr.) M. KONDOH, Head of Research Laboratory.

Programme/s offered Degree Bachelor Degree Master Ph.D Non-deg. Certificate Diploma Part of Other Spec

Year Programme Established
Duration (years) - length
of Programme

Enrollment

Current Part Time

Current Full Time

Other (specify)

of which

National

Foreign

Admission Requirements

Course Requirements - list
number of courses needed
whether thesis or notScholarship, Fellowship
Bursaries, etc. available

Language of Instruction

Total Numbers of Students Graduated

National Foreign

Administration

Scholarship

Research

Indicate % of funding by

Government

Industry

Other (specify)

Staff Numbers: Totals
(Indicate #s)Faculty Full Time () Part Time () Industry, Instructors ()
Speakers ()Industry Input
(Please tick)

Financial Administrative () Curriculum Development ()

Scholarship, Bursaries etc. () Overseas Body Industry Liaison ()

Comments

Course, Titles, Descriptions
Indicate Text Title (if any)Our company, TAKENAKA KOMITEN Co., Ltd., is one of representative
general contractors in JAPAN.
Please refer to our leaflets enclosed.

Educational Programme Objectives:

Research (Please tick)

Organizational (Applied) () Engineering (Hard) ()

Research Funding
(Indicate source & amount (US \$)Private source (TAKENAKA KOMITEN Co., Ltd.)
& National funds based on projects.Describe Nature/objectives
of Research
andOur Technical Research Laboratory has the following
research units:
FOUNDATION, STRUCTURE, BUILDING EQUIPMENT,
CONSTRUCTION, MATERIALS, ENVIRONMENT, etc.

Research Facilities (if any)

And the research fields of CONSTRUCTION unit includes
1) Engineering (Hard) 5) Building Equipment
2) Organization 6) Quality Control
3) Work study 7) etc.
4) Scheduling & Resource
Allocation

Are there any special features of your programme. Please indicate.

February 17th, 1981

Study of Construction Programmes

Name of Institution National University of Singapore
Faculty/School Faculty of Architecture and Building, Dept. of Building & Estate Management
address Kent Ridge, Singapore-0511, Republic of Singapore
Name, Title of Contact Assoc. Prof. Philip Motha, Head, Dept. of Building & Estate Management
Name, Title of Responder Surinder Singh, Senior Lecturer
Programme/s offered Degree Bachelor Degree Master Ph.D Non-Deg. Non-Deg. Part of Other
Certificate Programme Specific

Year Programme Established 1970 1970 1970
Duration (years) - length 4 1 3-5
of Programme

Enrollment

Current Part Time N.A. 1 1
Current Full Time 109 Nil Nil
Other (specify)
of which
National 93
Foreign 16

Admission Requirements Candidates must have passed in the General paper and at least two
Science subjects at advanced level in the Singapore-Cambridge G.C.E. Advanced Level
Course Requirements - list
number of courses needed Twenty nine in four years duration
whether thesis or not

Scholarship, Fellowship
Bursaries, etc. available Seven

Language of Instruction English
Total Numbers of Students Graduated National 133 Foreign 22
Indicate source of funding by Government 100
Industry 43
Other (specify)
Department
Industry Full Time (6) Part Time (6) Industry, Institution (2)
Staff Numbers: Totals
(Indicate %s)
Industry Input
(Please tick)
Financial Administrative () Curriculum Development ()
Scholarship, Bursaries etc. () Overseeing Body Industry Liaison ()

Comments

Course, Titles, Descriptions
Indicate Text Title (if any)

Degree Bachelor, B.Sc. Building,
1st Year: Economics, Theory and Practice of Building I
Building Sciences I, Law I, Theory and Design of
Structures I, Surveying and Levelling, Accounting I.
2nd Year: Theory and Practice of Building II,
Building Sciences II, Law II, Quantity Surveying I,
Theory of Management, Theory & Design of Structures II
Building Services & Equipment I.
3rd Year: Theory and Practice of Building III, Law III
Building Services and Equipment II, Quantity Surveying
Estimating & Price Analysis I, Project Management I,
Construction Economics & Cost Planning I,
Theory & Design of Structures.
4th Year: Theory and Practice of Building IV,
Quantity Surveying III, Project Management II,
Construction Economics & Cost Planning II,
Estimating and Price Analysis II, Professional Practice
and Procedure, Final Year Project.

Educational Programme Objectives:

To prepare the students for professional practice in
the building and construction industry so that after
adequate field experience graduates are capable of
entering managerial and executive positions.

Research (Please tick)

Organisational (Applied) () Engineering ()

Research Funding
(Indicate source & amount (US \$))

Varies from year to year.

Describe Nature/objectives
of Research

To tackle problems of the construction industry
Related to building practice, construction economics,
project management etc.

Research Facilities (if any)

All modern research facilities are available.

Are there any special features of your programme. Please indicate.

CIB - 1965
Study of Construction Programmes

February 17th, 1961.

Name of Institution Middle East Technical University
Faculty/School Faculty of Engineering, Department of Civil Engineering,
Address Division of Construction Strategy.. Ankara, TURKEY
Name, Title of Contact Dr. D. Arditi, Asst. Prof. of Civil Eng., Head of the Division
Name, Title of Respondent of Construction Strategy
Programme/s offered Degree Master Ph.D Non-deg. Part of
Bachelor Master Ph.D Diploma Certificate Programme Specify

Year Programme Established 1967
Duration (years) - length of Programme 2 to 3.5
Enrollment
Current Part Time 0
Current Full Time 9
Other (specify) -
of which
National 9
Foreign 0

Admission Requirements BS and 2.67 Min. cumulative grade point average

Course Requirements - list number of courses needed whether thesis or not

9 courses and thesis

Scholarship, Fellowship Bursaries, etc. available

Yes

Language of Instruction English
Total Numbers of Students Graduated National 19 Foreign 1
Administration 90 % Scholarship 90 % Research 90 %
Indicate % of funding by Government 100 %
Industry - 10 %
Other (specify) - 10 %
Staff Numbers: Totals Faculty Full Time (3) Part Time (2) Industry, Instructors (2)
(Indicate #s) Speakers
Industry Input Financial Administrative () Curriculum Development ()
(Please tick) Scholarship, Bursaries etc. (x) Oversees Body Industry Liaison (x)

Comments

- 2 -

Course, titles, Descriptions
Indicate Text Title (if any)

1. CE 101, Civil Engineering Drawing (At undergraduate level)
2. CE 231, Engineering Economy (At undergraduate level)
3. CE 432, Construction Engineering and Management (At undergraduate level)
4. CE 434, Construction Planning
5. CE 436, Forms and Scaffolding for Reinforced Concrete Structures
6. CE 403, Construction Site Techniques
7. CE 507, Application of Operational Research Methods to Construction Management Prob
8. CE 541, Introduction to Tunnel Construction

Educational Programme Objectives: To produce Civil Engineers who are aware of the problem in the industry and who are well equipped for higher managerial posts.

Research (Please tick) Organizational (Applied) (x) Engineering (Hard) (x)

Research Funding (Indicate source & amount (US \$) None

Describe Nature/objectives of Research and Research Facilities (if any) Research is of the "Applied" type. Research projects generally bring a solution to a specific problem encountered at company level. The objective is to increase efficiency by the use of modern methods or adequate measures whenever problems arise.

None

Are there any special features of your programme. Please indicate.

February 17th, 1981.

Name of Institution Chair of Construction Management Technical University of Istanbul

Faculty/School Faculty of Civil Engineering, I.T.U., İnşaat Fakültesi
address Yapi İşletmesi Kürsüsü, Taşkışla İstanbul/Turkey

Name, Title of Contact See Title of Respondent

Name, Title of Respondent Prof. Dr. -Ing. V. Doğan Sörgüç

Programme/s offered Degree Bachelor Degree Non-deg. Mon-deg. Part of
Bachelor Master Ph.D Diploma Certificate Programme SpecifyYear Programme Established 1977 Planned^{xx} 1977 Planned^{xx}Duration (years) - length 3 courses 1.5 years Duration
of Programme in C.E. depends
on thesis

Enrollment

Current Part Time education and 1 semester

Current Full Time diploma-project

125

Other (specify)

of which

National

110

Foreign

15

Admission Requirements Prerequisite

Courses Requirements - list Construction Management II

number of courses needed All C.E. courses

whether thesis or not diploma related

Scholarship, Fellowship project with

Bursaries, etc. available General scholarships thesis

available to C.E. students

Language of Instruction Turkish

Total Numbers of Students Graduated

National 25

Foreign

Indicate % of funding by Government 100% Administration 100% Scholarship 100% Research

Industry Negligible Starting

Other (specify)

Staff Numbers: Totals Faculty Full Time (7) Part Time (1) Industry, Instructors (1)

(Indicate #)'s (2 Prof., 5 Assistants) Speakers

Industry Input Financial Administrative () Curriculum Development ()

(Please tick) Scholarship, Bursaries etc. () Overseas Body Industry Liaison (x)

(x) Planned development related with x and xx above

Comments For remarks^{xxx} see please: "Development of Construction Education

Programme in Turkey", Prof. Dr. V. Doğan Sörgüç.

CIB W-65 II. International Symposium on Organization and Management in

Construction, Technion (Haifa) October 1978 (Vol. V).

Course, Titles, Descriptions
Indicate Text Title (if any)

1. Introduction to construction equipment.

Description: See the Directory of Construction Engineering Programs, CIB W-65
Text: "Yapi Makinalari", Prof. S. Ersoy (3 Volumes)

2. Construction Management I

Description: See the Directory of Construction Engineering Programs, CIB W-65
Text: Notes and Various books in Turkish

3. Construction Management II

Description: See the Directory of Construction Engineering Programs, CIB W-65
Text: Various books in Turkish and in Language of each student as his second Language (mostly English).Educational Programme Objectives: To-day's objective: Basic education of
C.E. students in Construction Management and practical training in
construction industry through diploma-project considering the subjects
of the basic education.Future objective: Training of managers and businessmen of the
Construction Sector.

Research (Please tick)

Organizational (Applied) (x) Engineering (Hard) ()

Research Funding Technical and Scientific Research Council of Turkey
(Indicate source & amount (US \$) 1500 US \$ (1 Project

(With the exchange rate of 1981)

Describe Nature/objectives
of Research

and

Research Facilities (if any) Computer System Burroughs 3700

Are there any special features of your programme. Please indicate.

The target of the program is to contribute to the solutions of problems in the
construction industry. This is also considered in the selection of research
works which are carried out at all levels. It follows that university industry
cooperation is continuously enforced and encouraged.

(P=Prüfungsfach bzw. Prüfungsvorleistung nach DP0)

Semester

Stand: 01.01.1977

| VERTIEFUNG | | ALLG. GRUNDSTUD | | | | | VOREXAMEN | |
|------------|-------------------------|---------------------------|-----------------------------|----------------------------|--------------------------------|----------------------------|--------------------|---------------------|
| 8 | Bauverf.-technik IV P | Operations Research II P | Research I P | Netzplan - technik P | Arbeitsvor - bereitung P | Unterneh - mensplanung P | Bauverf. Tunnelbau | Sicherheits-technik |
| | Sem. Bauab-wicklung P | Baubetrieb P | Rechtsfragen P | Übung Netzplan - technik P | Übung Baustellen - praktikum P | | | |
| 7 | Operations Research I P | Netzplan - technik P | Arbeitsvor - bereitung P | Unterneh - mensplanung P | Unterneh - mensplanung P | Management im Baubetrieb P | | |
| 7 | Bauverf.-technik III P | Übung Bau-verf. technik P | Leistungen + Kosten v. B. P | Wertschöpfungs-kette P | | | | |
| 6 | Bauverf.-technik II P | Baumaschi-nenpraktikum P | | | | | | |
| 5 | Bauverf.-technik I P | | | | | | | |
| 2 | | E-Technik P | | | | | | |
| | Maschinen-kunde P | | | | | | | |

CLB - 1455
Study of Construction Programmes

February 17th, 1961.

Name of Institution Technische Universität München
Faculty/School Fakultät für Bauingenieur- und Vermessungswesen
Address Arcisstraße 21, D-8000 München 2
Name, Title of Contact Prof. Dr.-Ing. Gerald Thurner
Name, Title of Respondent
Programme/s offered Degree Bachelor Master Ph.D Diploma Certificate Programme Specify

Year Programme Established 1964
Duration (years) - length of Programme 5 years
The offered Construction Program (=C.P.) is a part of the total program für Civil Engineers (=C.E.)

Enrollment
Current Part Time -
Current Full Time ~1000
Other (specify) of which
National ~90 %
Foreign ~10 %

Admission Requirements "Abitur" or similar
Course Requirements - list 4 courses for basic study of C.E.
number of courses needed; 0 courses for advanced study of C.P., about
whether thesis or not 50 % of students make a thesis.

Scholarship, Fellowship partially possible
Bursaries, etc. available

Language of Instruction German
Total Numbers of Students Graduated National ~800 Foreign ~80 (for C.P.)
Administration Scholarship Research
Indicate % of funding by Government 100 % ~100 % 1-0 %
Industry
Other (specify)

Staff Numbers: Totals 12 Faculty Full Time (8) Part Time (4) Industry, Instructors (4)
(Indicate %s)
Industry Input none Financial Administrative () Curriculum Development ()
(Please tick) Scholarship, Bursaries etc. () Overseeing Body Industry Liaison ()

Comments

- 2 -

Course, Titles, Descriptions
Indicate Text Title (if any)
for basic studies: Construction Management (= C.M.) I, II, III (3 course
Exercises to Construction Management

for advanced studies:
compulsory: Construction Management IV
Exercises to Construction Management IV
Safety of site work

optional:
three streams, each consisting of 3 courses
1. Scheduling techniques; project management; constructi
equipment
2. Bidding and contracting; building economics; legal
aspects in C.E.
3. Operation research in C.M.; statistics in C.M.; data
processing in C.M.

Educational Programme Objectives:

To educate Civil Engineers with Diploma, specializing in C.M.

Research (Please tick) Organisational (Applied) (x) Engineering (Hard) (x)

Research Funding
(Indicate source & amount (US \$)) included in general budget, not specified
separately

Describe Nature/objectives
of Research Research pertaining to all fields of C.M.

Research Facilities (if any) Computer facilities of the university

Are there any special features of your programme. Please indicate.

Study of Construction Programmes

February 17th, 1981.

- 2 -

Name of Institution DELFT UNIVERSITY OF TECHNOLOGY

Faculty/School DEPT. OF CIVIL ENGINEERING

Address Stevinweg 1, Delft, Holland

Name, Title of Contact D.J.Knip, Th.Horstmaier, D.W.Greven.

Name, Title of Respondent

| Programme/s offered | Degree | Degree | Non-deg. | Part of | Other |
|---------------------|--------|--------|----------|-------------|-----------|
| | halor | Master | Diploma | Certificate | Programme |
| | | | | | Specify |

| Year Programme Established | 1963 |
|----------------------------|------|
| Duration (years) - length | 5 |
| of Programme | |

Enrollment

Current Part Time

Current Full Time

Other (specify)

of which

National

Foreign

Admission Requirements

Course Requirements - list

number of courses needed

whether thesis or not

Scholarship, Fellowship

Bursaries, etc.available

for nationals governments scholarships are available

Language of Instruction

Dutch

Total Numbers of Students Graduated

est.

National 280

Foreign 15

Indicate % of funding by

Government

Industry

Other(specify)

Faculty Full Time (4)

Part Time (6)

Industry, Instructors (3)

Speakers

Financial Administrative ()

Scholarship, Bursaries etc.()

Over half of the current student enrollment fulfills the

master thesis requirements within industrie and other real

world projects.

Comments

Course, Titles, Descriptions
Indicate Text title (if any) (translated titles)

bb20: The organisation of Construction

bb21: The construction planning and decisionmaking in civil engineering projects

bb23: Project Organisation

bb30: System and Industrial Dynamics

Design and Constructions

bb25: Decision Analysis in Civil Engineering(all courses have text's with the same titl.

Educational Programme Objectives: Provide students with the tools and knowledge to be able to function successfully within a construction engineering environment

Research (Please tick)

Organisational (Applied) () Engineering (Hard) ()

Research Funding

(Indicate source & amount (US \$) Governmental \$ 150,000, -- est.

Describe Nature/objectives of Research Simulation modelling in Civil Engineering

Project Management

Design-build studies (c.a.d.

Research Facilities (if any) Project preparation

Real World companies to conduct research on exciting problem

National building research foundation

Are there any special features of your programme. Please indicate.

-For everyone out of the about 200 graduating C.E. students is it possible to undertake a (minor) construction project

-About 25 students undertake a major program

Name of Institution **UNIVERSITY OF TECHNOLOGY**

Faculty/School **NEW BOLLECH, Eindhoven, THE NETHERLANDS**

Name, Title of Contact **Professor is L.P. Sikkels**

Name, Title of Respondent

Programs/s offered

| Degree | Diploma | Non-dg. | Part of |
|----------|---------|---------|-----------------------|
| Bachelor | Master | Diploma | Certificate Programme |

Year Programme Established **5 years + 4 years (had 14/10/82)**

Duration (years) - Length of Programme **4 years + 4 years (after 14/10/82)**

Enrollment **None**

Current Part Time **10 semester, each 1/2 year**

Current Full Time **None**

Other (specify) **National**

of which **Foreign**

National **primary higher education school**

Foreign

Admission Requirements **None**

Course Requirements - List number of courses needed whether thesis or not **X**

Scholarship, Fellowship Bursaries, etc. available **None**

Language of Instruction

Total Numbers of Students Graduated

Indicate % of funding by

| Government | Industry | Other (specify) |
|------------|----------|-----------------|
| 100% | 0% | 0% |

Government

Industry

Other (specify)

Staff Numbers: Totals (Indicate %)

Industry: Input (Please tick)

Administrative () Curriculum Development ()

School Library, Bursaries etc. () Overseeing Faculty Industry, etc. ()

Comments:

Course, Titles, Descriptions Indicate Text Title (if any)

Study of Building Engineering

three years main course + two years study English transcript (indicate one year research in practice of industry)

Educational Programme Objectives:

Research (Please tick)

Organizational (Applied) (X) Engineering (Hard) (X)

Research Funding (Indicate source & amount (US \$))

35% of time to be used in Research

Describe Nature/Objectives of Research and

**A: Construction - operation objects
B: Construction - realization objects**

Research Facilities (if any)

not describe => own Laboratory in the University

Are there any special features of your programme. Please indicate.

[Signature]

3/1

Name of Institution Technical University of Budapest
 Faculty/School Faculty of Mechanical Engineering, Department of Business Management
 Address Division for Construction Management Budapest, Müegyetem rkp. 1-3.
 Name, Title of Contact
 Name, Title of Respondee

| Programme/s offered | Degree Bachelor | Degree Master | Degree Ph. D. | Non-deg. ^x Diploma | Non-deg. Certificate | Part of Programme | Other Specify |
|---------------------|-----------------|---------------|---------------|-------------------------------|----------------------|-------------------|---------------|
|---------------------|-----------------|---------------|---------------|-------------------------------|----------------------|-------------------|---------------|

Year Programme Established beginning at 1980

Duration (years) - length of Programme 2 years

Availability (Indicate current student nos)

Part-time

40 persons

Full-time

Other (specify)

National Year

all nat.

Foreign

Admission Requirements

First Univ. Degree

Course Requirements - list of courses needed and thesis/project

Univ. Degree in Mechanics, Electric or
Chemics

Scholarship, Fellowship

Bursaries, et c. available

Language of Instruction Hungarian

Total Numbers of Students Graduated

National -
Administration
100%

Foreign -
Scholarship
100%

Research
50%

Funding: Government
(Indicate %) Industry

50%

Staff Numbers: Totals
contemplated only

Faculty Full Time ()
1/3

Part time (2)
1/3

Industry, Instructors, Speakers ()
1/3

3/2

Industry Input
(Please tick)

Financial Administrative ()
Scholarship, Bursaries, etc (x)

Curriculum Development

Overseeing Body Industry Liaison ()

Course, Titles, Descriptions

Indicate Text Title (if any)

see attached

Educational Programme Objectives: To train experts in a high level for industrial companies, specializing in construction management, organization and economy

Research
(Please Tick)

Organizational (Applied) (x)

Engineering (Hard) ()

Research Funding

(Indicate source and amount (US \$))

Describe Nature/objectives of Research

To increase efficiency of construction projects by use of modern methods and systems

Research Facilities

(Describe briefly if any)

Publications by Programme - only those that can be purchased (do not list articles in publications or out of print)

none

() Please check in interested in having above listed in National Technical Information Service for world wide distribution. (Separate instructions will follow on procedures for submittal.)

Faculty of Mechanical Engineering
Division for Construction Management

I. Compulsory Subjects

- 1./ General Policy
- 2./ Accounting
- 3./ Construction law
- 4./ Practical Statistics
- 5./ Planning and Control of Quality
- 6./ Financial, Costing and Accounting Management
- 7./ Economy of Industry and Companies
- 8./ Theory of Organization
- 9./ Information systems
- 10./ Theory and Methodology of Decision
- 11./ Theory and Techniques of Management
- 12./ System Analysis

II. Special Subjects

- 1./ Trade Law
- 2./ Investment Law
- 3./ Investment Policy
- 4./ Applied Methodology in Organization
/ Models and techniques /
- 5./ Diploma Project

A/2

Industry Input (Please tick) Financial Administrative () Curriculum Development
Scholarship, Bursaries, etc (X) Overseeing Body Industry Liaison ()

Course, Titles, Descriptions
Indicate Text Title (if any) see attached

Educational Programme Objectives: To train contractors specializing in advanced constructions, techniques and their organization and economic

Research (Please Tick) Organizational (Applied) (X) Engineering (Hard) ()

Research Funding
(Indicate source and amount (US \$))

Describe Nature/objectives of Research Organization, some operations research techniques, materials.

Research Facilities
(Describe briefly if any)

Publications by Programme - only those that can be purchased (do not list articles in publications or out of print)

() Please check in interested in having above listed in National Technical Information Service for world wide distribution. (Separate instructions will follow on procedures for submittal.)

A/4

Name of Institution Technical University of Budapest
Faculty/School Faculty of Architecture, School of Contractor Experts
Address Műegyetem rakpart 1-3, Budapest
Name, Title of Contact dr. Pál NAGY Chairman of the Course
Name, Title of Respondee

| Programme/s offered | Degree Bachelor | Degree Master | Degree Ph. D. | Non-deg. Diploma | Non-deg. Certificate | Part of Programme | Other Specify |
|---------------------|-----------------|---------------|---------------|------------------|----------------------|-------------------|---------------|
|---------------------|-----------------|---------------|---------------|------------------|----------------------|-------------------|---------------|

| | | | | | | | |
|----------------------------|------|--|--|--|--|--|--|
| Year Programme Established | 1965 | | | | | | |
|----------------------------|------|--|--|--|--|--|--|

| | | | | | | | |
|--|---|--|--|--|--|--|--|
| Duration (years) - length of Programme | 2 | | | | | | |
|--|---|--|--|--|--|--|--|

| | | | | | | | |
|---|-----------|-----|----|--|--|--|--|
| Availability (Indicate current student nos) | Part-time | 1-2 | 40 | | | | |
| Full-time | | | | | | | |
| Other (specify) | | | | | | | |

| | | | | | | | |
|---------------|----|--|--|--|--|--|--|
| National Year | 38 | | | | | | |
| Foreign | 2 | | | | | | |

Admission Requirements First Univ. Degree
Course Requirements - list of Univ. Degree in Architecture or Civil Engineering

Scholarship, Fellowship

Bursaries, et c. available

Language of Instruction Hungarian

| Total Numbers of Students Graduated | National 348 | Foreign 2 |
|-------------------------------------|----------------|----------------------|
| | Administration | Scholarship Research |

| | | | |
|-----------------------|-----|-----|----|
| Funding: Government | 100 | 100 | 60 |
| (Indicate %) Industry | | | 60 |

Staff Numbers: Totals Faculty Full Time () Part time () Industry, Instructors, Speakers ()

Technical University of Budapest
School of Contractors Experts

A/3

| Subjects | Semester |
|--|--------------|
| New Building Materials | 1. |
| Mechanization of Building Processes | 1. and 2. |
| Mathematical Economy of Building | 1. and 2. |
| Civil Engineering in Building | 1. and 2. |
| / 1 and underlevel works in building / | |
| Safety of the Site | 1. |
| Contracts and Law in Construction | 1. |
| Advanced Building Technologies | 2. 3. and 4. |
| Advanced Trade Technologies | 2. 3. and 4. |
| Advanced Processes in Organization | 2. 3. and 4. |
| Introduction to the Computertechniques | 3. |
| Transport and Materialmanagement of | |
| Construction | 3. |
| Technologies of Concrete Structures | 3. |
| Problems of technology and Organization in the Industrialized Prefabrication | 4. |
| Introduction to the Theory of Organization | 4. |
| Light-weight Building Systems | 4. |
| Development and Efficiency of the Construction | 4. |
| Advanced Technologies in Mechanical and Electrical Systems for Building | 4. |

1/2 Industry Input (Please tick) Financial Administrative () Curriculum Development ()
Scholarship, Bursaries, etc (X) Overseeing Body Industry Liaison (X)

Course, Titles, Descriptions
Indicate Text Title (if any) see attached

Educational Programme Objectives: to train experts specializing in general contracting / single responsibility lump-sum projects/

Research (Please Tick) Organizational (Applied) () Engineering (Hard) ()

Research Funding
(Indicate source and amount (US \$)) --

Describe Nature/objectives of Research -

Research Facilities
(Describe briefly if any) -

Publications by Programme - only those that can be purchased (do not list articles in publications or out of print) Cycled text and summaries on selected topics / available on request from the Institute/

(X) Please check in interested in having above listed in National Technical Information Service for world wide distribution. (Separate instructions will follow on procedures for submittal.)

2/1 Name of Institution Institute of Postgraduate Studies at K. M. U. Economics

Faculty/School School of Economics Experts. General Contractors Course/ with special-
Address lization in domestic and export contracting/
POB 275 B 1431 Budapest HUNGARY

Name, Title of Contact dr. Sandor CSILLI Chairman of Guiding Committee of the above course
Name, Title of Respondee dr. László Lukács, Secretary of the same Committee

| Programme/s offered | Degree Bachelor | Degree Master | Degree Ph. D. | Non-deg. Diploma ^X | Non-deg. Certificate | Part of Programme | Other Specify |
|---|---|---------------|---------------|-------------------------------|----------------------|-------------------|---------------|
| Year Programme Established | 1979 | | | | | | |
| Duration (years) - length of Programme | 2 to 2,5 years | | | | | | |
| Availability (Indicate current student nos) | 30 persons | | | | | | |
| Part-time | 35 " | | | | | | |
| Full-time | 3. sem. | | | | | | |
| Other (specify) | 1. " | | | | | | |
| National Year | all nationals | | | | | | |
| Foreign | First Univ. Degree | | | | | | |
| Admission Requirements | Univ. Degree in Economics, Politechnics or Law | | | | | | |
| Course Requirements - list of courses needed and thesis/project | + 2 years practice | | | | | | |
| Scholarship, Fellowship | The tuition fees of those students sponsored by their com- | | | | | | |
| Bursaries, et c. available | panies are paid by their employer. | | | | | | |
| Language of Instruction | Hungarian | | | | | | |
| Total Numbers of Students Graduated | National - Foreign - | | | | | | |
| | Administration Scholarship Research | | | | | | |
| Funding: Government | The Institute is self supporting | | | | | | |
| (Indicate %) | Industry | | | | | | |
| Staff Numbers: Totals | Faculty Full Time () Part time (.) Industry, Instructors, Speakers () | | | | | | |
| | 0 1 20 to 30 | | | | | | |
| | * with possibility of obtaining master's degree | | | | | | |

| Subjects | Domestic Export Specialization | |
|----------|-----------------------------------|--------|
| | Domestic | Export |

| | | |
|---|---|---|
| 1. Theoretical Subjects | | |
| 1.a Economic Policy and Planning | + | + |
| 1.b Current problems of economics grow | + | + |
| 1.c Technical Progress | + | + |
| 1.d Development Economic and World Economy | + | + |
| 1.e Economic Relations with Developing Countries | + | + |
| 2. Methodology | | |
| 2.a System Analysis | + | + |
| 2.b Calculation of Economic Efficiency | + | + |
| 2.c Harmonization of Interest / Inter-company diplomacy/ | + | + |
| 2.d Accounting and Financial of Companies in G. C. | + | + |
| 2.e Planning Organization and the Management of Investments | + | + |
| 2.f Techniques of Foreign Trade | | + |
| 2.g International Forwarding and Transporting Surrance | | + |
| 3. G. C. E. | | |
| 3.a Business and Legal Environment for G. C. | + | + |
| 3.b General Contracting Law | + | + |

| | | |
|---|---|---|
| 3.c Fiscal and Financial Problems of G.C. | + | + |
| 3.d Organization of G. C. Agencies | + | + |
| 3.e The Functions of the G. C. | + | + |
| 3.f The G.C. and His Suppliers | + | + |
| 3.g The G.C.'s Market | + | + |
| 4. Workshops | + | + |

February 17th, 1981.

CIB - W65

Study of Construction Programmes

Name of Institution UNIVERSITY OF TRONDHEIM
NORWEGIAN INSTITUTE OF TECHNOLOGY
Faculty/School CIVIL ENGINEERING DEPARTMENT
address 7034 TRONDHEIM - NTH, NORWAY.
Name, Title of Contact PROFESSOR DR. ING. REIDAR HUGSTED
Name, Title of Respondent SAME
Programme/s offered Degree Bachelor Degree Master Ph.D Non-deg. Diploma Certificate Programme Specify

Year Programme Established Duration (years) - length of Programme 4 2 3

Enrollment Current Part Time 20 0
Current Full Time
Other (specify) of which
National Foreign NORWEGIAN

Admission Requirements STANDARD CERTIFICATE OF SECONDARY EDUCATION WITH SPECIALIZATION IN MATHEMATICS, PHYSICS AND CHEMISTRY
Course Requirements - list number of courses needed whether thesis or not PART OF STUDY. 2 YEARS. ABOUT 12-15 COURSES IN FIRST PART 1 1/2 YEAR. MASTER REQUIRES 3 COURSES AND THESIS (ONE YEAR).
Scholarship, Fellowship Bursaries, etc. available IS AVAILABLE TO ALL STUDENTS AS SCHOLARSHIPS AND LOANS FROM STATE STUDY BANK

Language of Instruction
Total Numbers of Students Graduated 10 PER National Foreign
WITH THESIS IN CONSTRUCTION YEAR Administration Scholarship Research
ENGINEERING 100 100 80
Indicate % of funding by Government Industry Other (specify) 20

Staff Numbers: Totals (Indicate #s)
Industry Input (Please tick) Financial Administrative (X) Curriculum Development ()
Scholarship, Bursaries etc. () Overseeing Body Industry Liaison ()
Speakers 4

Comments NORW. INST. OF TECHN. HAVE THREE ACADEMY DEGREES. THE DEGREE IN ENGINEERING REQUIRES A THESIS, TAKES 4 1/2 YEARS OF FULL TIME STUDY AND IS CONSIDERED EQUIVALENT OF MASTER DEGREES. THE DEGREE OF DR. ING. REQUIRES 2 1/2-3 YEARS OF FULL TIME STUDY WITH ADVANCED COURSES AND THESIS. IT IS CONSIDERED AS EQUIVALENT TO PH D.

Course, Titles, Descriptions
Indicate Text Title (if any)

1. CONSTRUCTION PLANNING. BASIC.
COVERS NETWORK PLANNING, OTHER PLANNING SYSTEMS, CALCULATION METHODS, INVESTMENT ETC.
2. BUILDING CONSTRUCTION. BASIC.
COVERS METHODS AND EQUIPMENT USED IN ALL SORTS OF CONCRETE WORK ALSO LABOUR RELATIONS AND INCENTIVES.
3. CONSTRUCTION ENGINEERING. BASIC.
COVERS HEAVY CONSTRUCTION WITH EMPHASIS ON TUNNELLING, FULL FACE, QUARRIES WITH EQUIPMENT AND METHODS, WORK REQUIREMENT AND LABOUR CONDITIONS.
4. BUILDING CONSTRUCTION, ADVANCED.
COVERS CONTRACTING AND LEGAL ASPECTS AND PROJECT PLANNING IN MORE DETAIL.
5. CONSTRUCTION ENGINEERING. ADVANCED.
COVERS IN DEPTH A SPECIFIC AREA IN CONSTRUCTION.
6. PROJECT WORK. ADVANCED. IS LINKED TO 4 OR 5.
7. MASTER THESIS.

Educational Programme Objectives:

TO ENABLE STUDENTS TO UNDERSTAND AND TAKE ACTIVE PART IN THE BUILDING AND CONSTRUCTION PROCESS. AFTER GRADUATION.

Research (Please tick) Organizational (Applied) (X) Engineering (Hard) (X)

Research Funding (Indicate source & amount (US \$) FROM GOVERNMENT WITH SOME ASSISTANCE FROM INDUSTRY. (10 - 15 000 \$ PER YEAR MAX).

Describe Nature/objectives of Research and Research Facilities (if any) TO DEVELOP BUILDING AND CONSTRUCTION CONSTRUCTION METHODS. TO DEVELOP CONSTRUCTION PLANNING METHODS TO DEVELOP MANAGING METHODS IN BUILDING AND CONSTRUCTION.

ONLY OFFICES. NO LABS. COMPUTER CAPACITY IS AVAILABLE.

Are there any special features of your programme. Please indicate.

MOST THESIS WORK ARE DONE IN COLLABORATION WITH CONTRACTING COMPANIES OR GOVERNMENT AGENCIES DOING BUILDING AND CONSTRUCTION WORK. STUDENTS MAY WORK ON SITES TO GET INFORMATION, GATHER MATERIAL AND TO ANALYZE PROBLEMS.

THE THIRD DEGREE OF DR. TECHN. IS SIMILAR TO THE DR. OF SCIENCE DEGREE. A MASTER THESIS IN CONSTRUCTION ENGINEERING REQUIRES THE STUDENT TO GO THROUGH CERTAIN COURSES COVERING PROJECT MANAGEMENT, CONSTRUCTION ENGINEERING (HEAVY CONSTRUCTION) AND BUILDING TECHNIQUES. ALSO PROJECT WORK MAY BE INCLUDED. THE TOTAL PROGRAM COVERED BY THE DIVISION OF CONSTRUCTION ENGINEERING COVERS THREE BASIC COURSES AND THREE ADVANCED COURSES. THE NORWEGIAN INSTITUTE OF TECHNOLOGY IS FINANCED BY THE GOVERNMENT. RESEARCH MONEY FROM OTHER SOURCES ARE AVAILABLE. STUDIES ARE FREE OF TUTION.

- 6. Soil mechanics and foundations
- 7. Reinforced concrete and masonry structures
- 8. Civil, industrial and agricultural buildings
- 9. Metal structures
- 10. Civil engineering technology
- 11. Engineering economy and legislation
- 12. Foreign languages

Research ☒ Organizational (Applied) ☐ Engineering (Hard) ☐
(Please tick)

Research Funding
(Indicate source & amount (US \$))

Describe Nature/objectives of Research

Efficient building systems, new civil engineering technologies for civil and industrial and agricultural buildings, modern methods for engineering design, management and economy

Research Facilities

(Describe briefly if any)

- Specialization of researchers and teachers at other romanian and foreign institutes (1 month - 1 year)

- Doctoral research in Romania and abroad

- Co-operation with building enterprises

Publications by Programme - only those

that can be purchased (do not
in publications or out of print)

Note Manuals and technical literature for above mentioned courses and others.

() Please check if interested in having above listed in National Technical Information Service for world wide distribution. (Separate instructions will follow on procedures for submittal).

1) Practice week

| Name of Institution | Name, Title of Contact | Degree | Degree | Non-deg. | Non-deg. | Part of |
|--|---|--|----------------------|--|----------|--------------------------------------|
| Faculty/School | Name, Title of Responder | Bachelor | Master | Ph.D. | Diploma | Certificate |
| Address | Programme/s offered | Programme Specify | | | | |
| INSTITUTUL POLITEHNIC CLUJ-NAPOCA | PROF DR ING EUGEN BEIU | 26 + 8 ¹¹ | 26 + 8 ¹¹ | | | |
| FACULTATEA DE CONSTRUCTII | | 3 | 5 | | | |
| 3400 CLUJ-NAPOCA (ROMANIA) STR EMIL ISAC NR 15 | | | | | | |
| | Year Programme Established | | | | | |
| | Duration (years) - length of Programme | | | | | |
| | Availability (Indicate current) | 360 | 360 | | | |
| | Part-time | 450 | 2150 | | | |
| | Full-time | | | | | |
| | Other (specify) | | | | | |
| | National | 400 | 1350 | | | |
| | Year | 50 | 800 | | | |
| | Foreign | | | | | |
| | Admission Requirements | Lycee graduates with school-leaving examination diploma | | | | |
| | Course Requirements - list of courses needed & thesis/project | 3 design projects 20/13 30/22 | | | | |
| | Scholarship, Fellowship | 150 | 800 | | | |
| | Bursaries, et c. available | | | | | |
| | Language of Instruction | ROMANIAN | | | | |
| | Total Numbers of Students Graduated | National avg 90 | | Foreign avg 15 | | |
| | Funding: Government | 100 | 95 | | | |
| | Industry | - | - | | | |
| | Other (specify) | - | 5 | | | |
| | Staff Numbers: Totals (Indicate #s) (2/3) | Administration | | Scholarship | | Research |
| | Industry Input (Please tick) | Full Time (4%) | | Part Time (-) | | Industry, Instructors, Speakers (6%) |
| | Course, Titles, Descriptions | Financial Administrative () Curriculum Development () | | Scholarship, Bursaries, etc () Overseeing Body Industry Liaison () | | |
| | Indicate Text Title (if any) | 1. Mathematical Analysis, Linear Algebra, Analytical Geometry, Programming | | | | |
| | | 2. Surveying | | | | |
| | | 3. Civil engineering materials | | | | |
| | | 4. Theoretical and applied physics | | | | |

February 17th, 1981.

Name of Institution Building Economics & Construction Management

Faculty/School Chalmers University of Technology

address S-412 96 GÖTEBORGS

Sweden

Name, Title of Contact Yngve Hammarlund, Prof. (head) or Hans C. Björnsson, Assoc. Prof.

Name, Title of Respondent Hans C. Björnsson, Assoc. Prof.

| Programme/s offered | Degree Bachelor | Degree Master Ph.D | Non-deg. Diploma | Non-deg. Certificate | Part of Programme | Other Specify |
|---------------------|-----------------|--------------------|------------------|----------------------|-------------------|---------------|
| | | | | | | |

| Year Programme Established | Duration (years) - length of Programme |
|----------------------------|--|
| | 1976 (current curriculum) |

4, 5 4

Enrollment:

Current Part Time

2

Current Full Time

40

Other (specify)

of which

National

90% 100%

Foreign

10% 0%

Admission Requirements Highschool/MCE for the PhD degree

Course Requirements - list number of courses needed

whether thesis or not The school has a general thesis requirement

Scholarship, Fellowship

Bursaries, etc. available

Language of Instruction Swedish

Total Numbers of Students Graduated

National

Administration

100%

Foreign

Scholarship

100%

Research

100%

Indicate % of funding by

Government

Industry

Other (specify)

Staff Numbers: Totals

(Indicate #s)

Industry Input

(Please tick)

Financial Administrative () Curriculum Development ()

Scholarship, Bursaries etc. () Overseas Body Industry Liaison (x)

Comments The construction programme in one of four optimal programs in the School of Civil Engineering towards the degree "civilingenjör" which is a four year programme. (eq. to MCE)

Course, Title, Descriptions
Indicate Text Title (if any)

Economics & Law
Building Economics and Organization
Human Aspects of Civil Engineering
Building Economics II
Construction Engineering Systems II
Accounting
Building Economics III
Construction Engineering Systems III
Town Planning Legislation

Educational Programme Objectives: The program shall give a) understanding for the mutual dependence between building and social development, b) a broad economic basis of knowledge with emphasis on building economy.
The program aims at enabling the students to identify, formulate and solve problems related to construction and to acquire knowledge from techno-economic research and development activities

Research (Please tick) Organizational (Applied) (x) Engineering (Hard) ()

Research Funding
(Indicate source & amount (US \$))

The Council for Building Research (BFR), Sweden

Describe Nature/objectives of Research and

Five areas:

1. Economics & Building: The role of the building industry in the economy

2. Project Management

3. Applications of Systems Analysis/Operations Research to Construction

4. Cost Estimating & Cost Control

5. Construction Engineering Systems: Analysis, choice and organization of production factors

Research Facilities (If any)

Are there any special features of your programme. Please indicate.

CIB - W65
Study of Construction Programmes

February 17th, 1981.

Name of Institution Department of Construction Management and Industrial Engineering
Faculty/School Lund Institute of Technology, P.O.B. 725, S-220 07 Lund 7, Swe
address

Name, Title of Contact Sten E. Wallin, Professor, D.Sc.

Name, Title of Respondent

Programme/s offered Degree Bachelor Degree Master Ph.D Diploma Non-deg. Part of Other
Certificate Programme Spec

Year Programme Established x x
Duration (years) - length 4 8
of Programme

Enrollment

Current Part Time 5 %

Current Full Time 95 %

Other (specify)
of which

National

Foreign Swedish
20 % start 5 % finish

Admission Requirements

Higher school certificate

Course Requirements - list
number of courses needed
whether thesis or not

Scholarship, Fellowship
Bursaries, etc. available

Very few

Language of Instruction

Swedish

Total Numbers of Students Graduated

National 60

Foreign 1

Indicate % of funding by

Government

Industry

Other (specify)

Staff Numbers: Totals

(Indicate #s)

Faculty Full Time (1) Part Time (3) Industry, Instructors (H)
Speakers

Industry Input

(Please tick)

Financial Administrative (x) Curriculum Development (x)
Scholarship, Bursaries etc. () Overseeing Body Industry Liaison (x)

Comments

Course, Titles, Descriptions
Indicate Text Title (if any)

1. Construction management and general housing construction
The project work
The purchasing
The financing

2. Production - and cost monitoring in construction industry
The calculation
The monitoring in production phase
The local management on building site
The general conditions of production
Computer assistance

3. Real estate management
The management law
The assessment
Maintenance and repairs
etc.

Educational Programme Objectives

Designing production processes adapted to the
conditions on the building sites
Designing environments for comfort and safety;
Planning and managing work in the production of
buildings, plants, transport system and construction

Research (Please tick)

Organizational (Applied) (x) Engineering (x)

Research Funding

(Indicate source & amount (US \$))

Swedish Building Research Institute \$ 100,000

Describe Nature/objectives

of Research

Cost monitoring of projecting and production

and

Research Facilities (if any)

Computers

Are there any special features of your programme. Please indicate.

Name of Institution Department of Building Economics and Organization

Faculty/School The Royal Institute of Technology
address S-100 44 Stockholm, Sweden

Name, Title of Contact Professor Hans G Rahn
Name, Title of Respondee Professor Hans G Rahn

Programme/s offered Degree Bachelor Degree Master Non-deg. Certificate Part of Other
Ph.D Diploma Programme Special

Year Programme Established 1981 1976
Duration (years) - length 4 4 (5)
of Programme

Enrollment

Current Part Time 2

Current Full Time 340 1

Other (specify)
of which

National 270 3
Foreign 70

Admission Requirements

Student Civil
Examination Engineer

Course Requirements - list
number of courses needed 160 points x) 140 points x)
whether thesis or not incl thesis

Scholarship, Fellowship
Bursaries, etc. available

yes yes

Language of Instruction

Swedish Swedish

Total Numbers of Students Graduated

National 90 Foreign 20

Indicate % of funding by

Government 100
Industry
Other (specify)

Administration 100
Scholarship 100
Research 95

Staff Numbers: Totals
(Indicate #'s)

Faculty Full Time (3) Part Time (3) Industry, instructors 000
Speakers

Industry Input
(Please tick)

Financial Administrative () Curriculum Development (X)
Scholarship, Bursaries etc. (X) Overseeing Body Industry Liaison ()

Comments x) 1 point = 1 effective week of studies

Research - Organizational (Applied) Research Funding - Swedish Council for R&D, 1980

SUMMARY OF COURSES FOR CIVIL ENGINEERING STUDENTS

| Course | Year | Status | Lectures (h) | Exercises (h) | Number of Student |
|--|------|------------|-----------------|------------------|-------------------------|
| (a) Construction Industry and the Economy | 1 | Compulsory | 18 | 12 | 140 |
| (b) Building Economics | 3 | Compulsory | 30 | 60 | 120 |
| (c) Construction Management | 3 | Optional | 24 | 54 | 60 |
| (d) Law for the Construction Industry | 4 | Optional | 24 | 12 | 50 |
| (e) Property Management | 4 | Optional | 24 | 12 | 50 |
| (f) Planning of Rock Blasting Operations | 4 | Optional | 12 | 36 | 50 |

(a) Construction Industry and the Economy

The first course encountered by the students is intended to provide an elementary introduction to the economic links between the construction industry and society as a whole. Thus a broad coverage of the construction process, market conditions for the industry and government means of control is presented. Half the course is devoted to the fundamentals of the economic theory.

(b) Building Economics

In their third year, all students participate in a course that emphasizes management and economic control in construction projects, from feasibility studies to operational planning and estimating for the contractor. Exercises deal mainly with the application of planning and estimating methods. A wide range of subjects may also be chosen for seminar papers, based on computerized information retrieval.

(c) Construction Management

Another third-year course offers a more specialized treatment of the construction phase together with preceding negotiations. Activities of the construction firm are analysed. An overview of construction methods and typical problems of occupational health and safety in the industry is given.

(d) Law for the Construction Industry

A number of legal subjects with special relevance to the construction industry are developed within this course: the structure of building legislation, labor market laws, the law of contract and applications of standard agreements and contracts.

(e) Property Management

Recent emphasis on life cycle costs and the existing stock of buildings has prompted the creation of a course that deals with legal and economic aspects of property management, including maintenance planning.

(f) Planning of Rock Blasting Operations

A vital issue in Swedish construction exports is efficient planning and performance in rock blasting operations. Methods and equipment are taught in this course.

The postgraduate program

Higher technical education above the degree of Civilingenjör is uniform in Sweden: nominally, there is a four-year education leading to the degree of Teknologie Doktor. About half the time is devoted to courses, and the remainder is spent on the dissertation, which has to be published and defended in public.

Seminars on various research topics are held by the Department about five times each year. Otherwise, there are no fixed courses except set lists of literature, but without any formal teaching, due to limited resources and the small number of postgraduate students. Actually, co-operation with the University of Stockholm and the Stockholm School of Economics makes it possible to follow courses there, a possibility which is used by the majority of research students.

In most cases, research is funded by the Swedish Council for Building Research. Practically all research work is more or less closely tied to dissertation projects. Recent dissertations concern integrated systems for planning and estimating in the construction firm (U. Danielson) and government support of housing rehabilitation (J. Bröchner).

Ongoing research includes a project on the influence of user behavior on energy consumption in single-family housing (E. Lundström).

New courses during the academic year 1981-82:

| | Year | Status | Lectures (h) | Exercises (h) | Number of students |
|-----------------------------|------|----------|-----------------|------------------|-----------------------|
| (g) Project Management | 4 | Optional | 18 | 24 | 50 |
| (h) Business Administration | 4 | Optional | 24 | 48 | 40 |

Study of Construction Programmes

February 17th, 1981.

Name of Institution Institute for Planning, Project and Construction Management
 Faculty/School Swiss Federal Institute of Technology in Zurich
 address ETH-Henggerberg, 8093 Zurich, Switzerland
 Name, Title of Contact Prof. Dr. A. Pozzi (Chairman), Prof. Dr. O. Stradal
 Name, Title of Respondee

Programme/s offered Degree Bachelor Degree Master Ph.D Degree Non-deg. Certificate Programme Part of Other Specify

Year Programme Established 1972 1974 1972
 Duration (years) - length 4 1/2 1 1/2 3 1/2
 of Programme

Enrollment
 Current Part Time
 Current Full Time 60 6-8 2
 Other (specify)
 of which
 National
 Foreign

Admission Requirements Examination or High School Diploma (Mature)

Course Requirements - list number of courses needed whether thesis or not 6 8 Thesis Thesis
 Scholarship, Fellowship Bursaries, etc. available Application at Federal State Level

Language of Instruction German
 Total Numbers of Students Graduated National 100 Foreign 10
 Administration Scholarship Research
 Indicate % of funding by Government 100% 100% 70%
 Industry 30%
 Other (specify)

Staff Numbers: Totals (Indicate #)'s Faculty Full Time () Part Time () Industry, Instructors ()
 Industry Input Financial Administrative () Curriculum Development ()
 (Please tick) Scholarship, Bursaries etc. () Oversees Body Industry Liaison ()

Comments

Course, Titles, Descriptions
 Indicate Text Title (if any)

A. General Courses for all Students:
 1. Sem. Engineering Economy 1 2/0 Special Construction Methods 2/1
 2. Sem. Engineering Economy 2 2/1 Cost Accounting 1/1
 3. Sem. Engineering Project Planning 2/2 Systems Engineering 1/1
 4. Sem. Construction Methods 2/2 Construction Management 2/1
 5. Sem. Design Management 2/1
 6. Sem. Legal Aspects 1 2/1
 Operations Research 2/1
 Economics 1 1/1
 8. Sem. Project Management 2/1
 Managing Construction Business 2/1
 Legal Aspects 2 2/1
 Operations Research 2/1
 Economics 2 1/1

Educational Programme Objectives:

A continuous training of all Civil Engineering Students at the undergraduate level in the first 6 Semester, followed by one year of specialization in the field of Project and Construction Management of a wide number of students at the masters level.

Research (Please tick)

Organizational (Applied) (X) Engineering (Hard) ()

Research Funding
 (Indicate source & amount (US \$))

University and Government Funds
 Industry and Special Funds

Describe Nature/objectives
 of Research

- Rules to Design Project organisations
 - Methodologie for Problem solving in Engineering
 - Management of Large Projects

and

Research Facilities (if any)

- Cost-Benefit Analysis Techniques in Engineering
 - Micro Computers in Construction Management

Are there any special features of your programme. Please indicate.

February 17th, 1981.

Study of Construction Programmes

Name of Institution Heriot-Watt University, Edinburgh, U.K.

Faculty/School Department of Building, Faculty of Engineering,
address Chambers Street, Edinburgh EH1 1HX.

Name, Title of Contact

Name, Title of Respondent Professor V.B. Torrance

Programme/s offered

Degree Bachelor Degree Master Ph.D Degree Non-deg. Certificate Non-deg. Part of
SpecifyYear Programme Established 1960 1977 1972 1977 None Yes
Duration (years) - length 4 yrs. 1 yr. 3 yrs. 1 yr. Blocks
of Programme f.t. or f.t. or f.t. or B.Sc.
1981/82

Enrollment

Current Part Time Nil 10 2 2

Current Full Time 30 10 3 4

Other (specify)

of which Block

National 20 14 2 2

Foreign 10 7 2 4

Admission Requirements

Maths, Hon. Deg. Hon.

Physics, or Prof. Deg. or

Chemistry. Member Masters

Degree

Course Requirements - list

number of courses needed 278 78 Thesis 78

whether thesis or not Dissertation Thesis Only Project

Scholarship, Fellowship Govt. Student Govt. Govt. (SRC) Govt.

Bursaries, etc. available Grants SRC & Univ. Training

Physicist Pursuing Grant.

Language of Instruction English

Total Numbers of Students Graduated

National 32 Foreign 16

Administration Scholarship Research

100 % 40% 80%

Indicate % of funding by Government

Industry - 35% 20%

Other (specify)

Studs. Own Finance - 25%

Faculty Full Time (14) Part Time (10) Industry, Instructors (8)

Staff Numbers: Totals (Indicate \$'s)

Industry Input (Please tick)

Financial Administrative () Curriculum Development ()

Scholarship, Bursaries etc. () Overseeing Body Industry Liaison ()

Comments

Course, Titles, Descriptions
Indicate Text Title (if any)B.Sc. (Hons.) in Building Technology & Management.
(B.Sc. (Hons.) in Building Economics & Quantity Surveying
running but not included in the form)M.Sc. in Construction Management
(M.Sc. in Acoustics, Noise and Vibration is running
but has not been included)Ph.D. is by research alone, resulting in the
submission of a thesis.The Ph.D. candidates listed are only those in
Construction Management.

Educational Programme Objectives:

Mainly the preparation of managers and senior
managers for the Construction Industry. There
are 8 others in allied areas.

Research (Please tick)

Organizational (Applied) () Engineering (Hard) ()

Research Funding
(Indicate source & amount (US \$))U.K. Science Research Council
(total \$100,000)Describe Nature/objectives
of Researcha) Motivation of Construction Workers.
b) Computer Management of Maintenance.c) Selection and personality matching processes
for professional personnel.

Research Facilities (if any)

Are there any special features of your programme. Please indicate.

In the M.Sc. (Construction Management) programme there is a somewhat unique content
of industrial psychology with personnel management.

INSTITUTION: UNIVERSITY COLLEGE LONDON.

SCHOOL: The Bartlett School of Architecture and Planning.

CONTACT: Professor Donald Bishop) 01 - 387 - 7050.
Mr. John Andrews)

PROGRAM: Taught MSc. Building Economics and Management.

ESTABLISHED: 1963. Current regulations 1968.

COURSE: 1 year full-time.
2 years part-time.

ENROLMENT: Full-time - 8
Part-time - 4
National - 8
"Overseas" - 4

ADMISSION: First Second Class Honours Degree or equivalent or RIBA Part II.
(M.C.I.O.B. with qualifying exam).

COURSE REQUIREMENTS: Four course units plus a dissertation.

SCHOLARSHIPS: Science Research Council grants.

LANGUAGE OF INSTRUCTION: English.

FACULTY ACADEMIC STAFF: Full-time - 30
Part-time - 48
Occasional - many.

COURSE TITLES: Building Economics and Management is concerned with the construction industry as a whole and with the economic management of projects and programmes.

OBJECTIVES: The programme has been designed to provide:
- a specialist professional course within the initial training of an architect, builder or engineer
- an advanced academic course for University teachers
- a research training course
- a mid-career course for applicants who wish to keep up-to-date with professional developments.
Students are selected from a variety of academic, professional and national backgrounds

RESEARCH: Applied economics.

RESEARCH FUNDING: Mostly by central government.

RESEARCH OBJECTIVES: To study building as an economic system: recent work has concentrated on the capacity of the industry, its response to demand, and on aspects of health and safety.

Donald Bishop,
Professor of Building.
May, 1981.

February 17th, 1961.

C13 - 1965
Study of Construction Programmes

Name of Institution UNIVERSITY OF LIVERPOOL
Faculty/School Department of Building Engineering,
address P.O. Box 147, Liverpool L69 3BX.
Name, Title of Contact Mr. S. Whitehead,
Name, Title of Respondee Senior Lecturer.
Programme/s offered Degree Master Ph.D Diploma Certificate Programme Specify
Bachelor Master Ph.D Diploma Certificate Programme Specify

Year Programme Established 1965
Duration (years) - length of Programme 3 2 3
Enrollment
Current Part Time - - -
Current Full Time 95 1 0
Other (specify) of which
National 35
Foreign 30
Admission Requirements Degree:- 3 OCE A Level + English Language Master +
Qualification Ph.D. Good Honours Degree
Course Requirements - list number of courses needed whether thesis or not - As per syllabus. Masters then transfer, if recommended to Ph.D.)
Scholarship, Fellowship Bursaries, etc. available A few undergraduate scholarships and postgraduate studentships are available.

Language of Instruction
Total Numbers of Students Graduated National 18% Foreign 8% *Average each year
Administration Scholarship Research
Indicate % of funding by Government 80% - 25%
Industry 5% - -
Other (specify) Self 15% - Self 75%
Faculty Full Time (10) Part Time (0) Industry, Instructors Speakers Occasional ()
Staff Numbers: Totals (Indicate #s)
Industry Input Financial Administrative () Curriculum Development ()
(Please tick) Scholarship, Bursaries etc. () Overseeing Body Industry Liaison ()

Comments

Course, Titles, Descriptions
Indicate Text Title (if any)

1. Building Construction Engineering) Undergraduate courses
2. Building Services Engineering)
3. (Masters and Ph.D. degrees are obtained by research rather than taught courses).

Educational Programme Objectives: To produce graduates capable of improving standards in, and acceptable to, the building construction and services engineering industries.

Research (Please tick) Organizational (Applied) (✓) Engineering (Hard) (✓)

Research Funding (Indicate source & amount (US \$) Science Research Council - approx. \$100,000 p.a.

Describe Nature/objectives of Research and Acoustics - problems of structure-borne sound transmission in buildings
Materials - curing of cement pastes
Management - layout planning of building spaces
Energy - heat transfer
Research Facilities (if any) Controlled environment room
Acoustic suite
Materials Laboratory
Are there any special features of your programme. Please indicate.

LIST OF INSTITUTIONS INVITED

* THOSE RESPONDING ARE INDICATED BY AN ASTERISK

CANADA

Mr. H. Ahuja
Memorial University of Newfoundland
Engineering & Appl. Science
St. John's Nfld. A1C 5S7

Prof. D. H. Lee
University of Toronto
17 Wychwood Park
Toronto, Ontario M6C 2V5

* V. K. Handa, Professor
Dept. of Civil Eng
University of Waterloo
Waterloo, Ont. Canada N2L 3G1

Mr. Ken Selby, Associate Professor
Dept. of Civil Eng., University of Toronto
Toronto, M5S 1A4, Canada

* Paul Fazio, Ph.D. Eng.
Professor and Director
Centre for Building Studies
Concordia University, 1455 de Maisonneuve Blvd. W.
Montreal Quebec Canada
H3G 1M8

Dr. G. Ross
Environmental Design
University of Calgary
Calgary, Alberta T2N 1N4

Prof. Eldon Fowler
Dept. of Civil Eng.
University of Alberta
Edmonton, Alberta

WEST INDIES

* Univ. of the West Indies
Dept. of Civil Engineering
St. Augustine
Trinidad & Tobago

ARGENTINA

Professor R. Humar
Echeverria 1168
Florida 1602
Argentina

AD-A114 066

CONSTRUCTION ENGINEERING RESEARCH LAB (ARMY) CHAMPAIGN IL F/G 5/9
DIRECTORY OF CONSTRUCTION ENGINEERING PROGRAMS IN ORGANIZATION --ETC(U)
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U.S.A.

* Mr. G. H. Blessis
N. Carolina State Univ
Box 5993
Raleigh, North Carolina
27650

Mr. J. Borcharding
Univ. of Texas at Austin
ECJ 5.200 Architectural Eng.
Austin, Texas 78712

Mr. G. M. Brey
Capital Campus, Penn State
Middletown, Penn 17057

Mr. S. L. Bridwell
Penn State - Mont Alto
Campus
Mont Alto, Penn 17237

Mr. C. L. Burton
Kansas State Univ
Rm. 239 Seaton
Dept. Arch Eng. & Const.
Manhattan, Kansas 66502

* Prof. R. D. Logcher
Dept. of Civil Eng.
Mass Inst. of Tech
Cambridge Mass
02139 U.S.A.

Dr. H.H. Graves
Const. Mgmt. Pgm.
School of Architecture
Pratt Inst.
Brooklyn New York, 11205

Dr. G. H. Albright
Dept. of Architectural Eng.
101 Eng. Unit "A:
Penn State Univ.
Univ. Park, Penn. 16802

* Nathan Streitman, Chairman
Const. Mgmt.
Pratt Institut
Const. Mgmt. Programme
School of Architecture
Higgins Hall, Brooklyn NY
11205

Mr. E. Koehn
Ohio Northern University
Ada, Ohio 45810
U.S.A.

Mr. R. Kornamik
Pennsylvania State Univ.
Capitol Campus
Middletown, Penn. 17057

Mr. M. J. Long
Farleigh Dickinson Univ.
1000 River Rd.
Teaneck, New Jersey 07666

Mr. D. P. Lyons
Penn State Univ.
Hazleton Campus
Hazleton, Penn 18201

Mr. D. H. Martin
Colorado State Univ
Guggenheim Hall
Fort Collins, Colorado
80523

Montgomery College
Civil Eng.
Rockwell, Maryland

Wentworth Inst. of Technology
550 Huntington Ave.
Boston, Massachusetts, U.S.A

* Head Civil, New Mexico State
University
Las Cruces, New Mexico
88001

Univ. of Texas, Head of Civil
El Paso
El Paso Texas

Head Dept. of Civil Eng.
Brigham & Young Univ.
Provo, Utah 84602

* Mr. L. Bell
Auburn University
Dept. of Civil Eng.
Auburn, Alabama 36830

U.S.A.

Purdue University
Dept. of Building Const & Contracting
School of Technology , SCAA
West Lafayette, Indiana 47907

Univ. of Southern Mississippi
Dept. of Const. & Architectural Tech.
Southern Station, Box 5137
Hattiesburg, Mississippi 39401

* Southern Missouri State College
Dept. of Industrial Education
Springfield Missouri 65803

Spring Garden College
Const. Eng. Tech.
102 East Mermaid Lane
Chestnut Hill, Penn 91922

Temple Univ.
Dept. of Civil Eng.
College of Eng. Tech.
Philadelphia, PA 19122

Texas A & M University
School of Architecture
College Station Texas 77843

Texas A & M University
College of Eng.
College Station, Texas 77843

Virginia Polytechnic Inst.
Dept. of Bldg. Const.
College of Architecture
Blackburg, Virginia 24061

Kean College of New Jersey
Dept. of Industrial Studies
Union, New Jersey 07083

Louisiana State University
Dept. of Construction
Baton Rouge, Louisiana 70803

Louisiana Tech Univ.
Dept. of Civil Eng.
Ruston, Louisiana 71272

* Memphis State Univ.
Division of Eng. Tech- Const.
Memphis Tennessee 38152

Mr. C. G. Etter
Villanova University
Dept. of Civil Eng.
Villanova, Penn. 19085
U.S.A.

Mr. F. Gallo
The Cleveland State University
1983 East 24th St.
Cleveland, Ohio 44115
U.S.A.

Mr. S. Hamman
Clarkston College
Pottsdam, N.Y. 13676
U.S.A.

Mr. G. A. Hazen
Ohio University
117 Eng. Bldg.
Athens, Ohio 45701
U.S.A.

Mr. W. E. Mattis, Jr.
Pennsylvania State Univ.
Delaware County Campus
25 Yearsley Mills Rd.
Media, Penn 19063

* Mr. D. W. Halpin
Georgia Inst. of Technology
School of Civil Eng.
Atlanta, Georgia 30332
U.S.A.

* Mr. R. B. Harris
The University of Michigan
Dept. of Civil Eng.
Ann Arbor, Michigan 48109
U.S.A.

Mr. W. Hester
Dept. of Civil Eng.
Univeristy of California
Berkeley, California 94720

Mr. S. K. Jain
Southern University
Baton Rouge, Louisiana 70813

Mr. E. E. Johnson
South Dakota State University
Brookings, South Dakota 57006

U.S.A.

Dr. L. T. Boyer
Dept of Civil Eng.
Univ. of Illinois
Urbana, IL 61801

* Henry George Irwig
Dept. of Civil Eng.
Case Western Reserve University
Cleveland, OH 44106

Prof. John Fondahl
Dept. of Civil Eng.
Stanford Univ.
Stanford, CA 94305

Prof. R. Tucker, Colin M. Popesen
Dept. of Civil Eng.
The Univ. of Texas at Austin
ECJ 5.2
Austin, Texas 78712

Gunter Schmidt
Dept. of Architecture
School of Arch & Envir. Design
State Univ of New York at Buffalo
Buffalo, N.Y. 14214

* Prof. Jack H. Willenbrock
Dept. of Civil Eng.
Penn State Univ.
University Park P.A. 16802

Dr. David I. Cleland, Professor
University of Pittsburgh
1035 Benedum Hall
Pittsburgh PA 15261

* Head, Dept. of Civil Eng.
University of Wisconsin
Madison, Wisconsin 53706

Prof. John Havers
Const. Eng. Div.
Purdue University
Civil Eng. Bldg
W. Lafayette
Indiana 47907

Head, Dept. of Civil Eng.
U. of Alaska
Alaska, Fairbanks
99701, U.S.A.

Director, Falls Mgmt. Inst.
5151 Glenwood Ave.
Raleigh, N.C.
27612

Colorado State U.
Head Dept. of Civil
Fort Collins, Colorado
80523
(also Head, Dept. of
Industry Science)

Dept. of Industrial Education
& Technology
University of Maryland Eastern
Princess Anne, Maryland 21853

* Head of Civil
Ferris State College
Big Rapids
Michigan, 49307

North Dakota State University
Fargo ND

Head, Civil, Cornell University
Ithaca, New York
14850

Head of Dept. of C.E.
Univ. of Tennessee
Knoxville, Tenn
37919

Head Industry and Technology
E. Texas Univ. Commerce
75428

Dept. of Architecture & Civil
S. Illinois University
Carbondale, 62901

* Prof. J. Schaub
Dept. of Civil Eng.
Univ. of Florida
Gainesville, Florida 32611

R. Larew,
Dept. of Civil Eng.
The Ohio State University
Columbus, Ohio 43210

U.S.A.

Dr. J. J. Adrian
Bradley Univ.
5317 N. Woodview Ave.
Peoria, Ill 61614

Florida International Univ.
School of Tech, Const. Dept.
Tamiami Campus
Miami, Florida 33199

California State - Fresno
Dept. of Industrial Arts and Tech
Fresno, California 93726

California State Fresno
Dept. of Industrial Arts & Tech
Fresno California 93726

California State Polytechnic Univ.
School of Architecture & Environ.
San Luis Obispo, California 93407

* Bowling Green State Univ.
Industrial Education & Tech.
Bowling Green Ohio 43404

Arizona State Univ.
Div. of Construction
College of Eng. & applied Science
Tempe, Arizona 85281

Purdue University
Civil Eng.
West Lafayette, Indiana 47907

* Dr. J. W. Melin
Univ. of Illinois at Urbana - Champaign
3142 Civil Eng. Bldg.
Urbana, Ill. 61801

Dr. J. M. Neil
Texas A & M University
College Station, Texas 77843

Dr. G. G. Peterman
Arizona State University
College of Eng. & App Science
Tempe, Arizona 85281

Dr. L. H. Pugh
The Pennsylvania State Univ.
Capitol Campus
Middletown Penn 17057

* University of Nebraska
Dept. of Construction Mgmt.
College of Eng. & Tech
Lincoln, Nebraska 68688

State Univ. of New York at Syracuse
Wood Products Eng.
Syracuse, New York 13210

Univ. of North Carolina
Eng. Technology
UNCC Station
Charlotte North Carolina 28223

Northeast Louisiana Univ.
School of Const.
Monroe, Louisiana 71209

Ohio State Univ.
Dept. of Civil Eng.
2070 Neil Ave.
Columbus, Ohio 43210

Oklahoma State Univ.
School of Tech.
Div. of Eng.
Stillwater, Oklahoma 74074

Oregon State University
Civil Eng. Dept.
Corvallis, Oregon 97331

University of Washington
Dept. of Building Construction
College of Architecture & Urban
Planning
Seattle, Washington 98105

Washington State University
Const. Mgmt
Dept. of Architecture
Pullman, Washington 99164

West Virginia State College
Dept. of Industrial Technology
Institute, West Virginia 25112

* University of Wisconsin Platteville
College of Business, Industry & Comm.
Dept. of Industrial Studies
Platteville, Wisconsin 53818

Univ. of Wisconsin Stout
School of Industry & Technology
Menomonie, Wisconsin 54751

U.S.A.

Mr. W. H. Adkins
Univ. of Nebraska
School of Technology
P.O. Box 688
OMAHA, Nebraska 68101

Prof. S. J. Fenves
Dept. of Civil Eng.
* Carnegie-Mellon Univ.
Schenley Park
Pittsburgh, Penn. 15215

Director, Dept. of Eng.
U.S. Military Academy
Point, NY 10996

Prof. C. J. Marshall
Director & University
Architect
Univ. of Kentucky
Rm. 221, Service bldg
Lexington, Kentucky 40506

Prof. A. Messinger
Grad. School of Fine Arts
Development of Architecture
Univ. of Pennsylvania
Phildelphia, Penn. 19174

Mr. H. W. Busching
* Clemson Univ.
Civil Eng.
110 Lowry Hall
Clemson, South Carolina 29631

Mr. Robert L. Carr
Univ. of Colorado
Dept. of Civil Eng. & Arch.
ng. ECOT4-34
Boulder, Colorado 80309

Mr. L. A. Corbett
Pennsylvania State Univ.
Wilkes-Barre Campus
Box 1820 Wilkes-Barre, Penn
18701

Mr. R. F. DeBruhl
North Carolina State Univ.
Civil Eng. Dept.
P.O. Box 5993
Raleigh, North Carolina 27607

D. A. Halperin, Director
Univ. of Florida
School of Bldg. Const.
Gainesville, Florida 32611, U.S.A.

University of Houston
Dept. of Civil Tech.
Houston, Texas 77044

Indiana Univ. Purdue
* University at Indianapolis
Dept. of Const. Technology
1201 East 38th Street
Indianapolis, Indiana 46205

Iowa State University
Construction Eng.
Ames, Iowa 50010

Jackson State University
* School of Industrial & Technical
1325 J. R. Lynch St.
Jackson, Mississippi 39217

John Brown University
Dept. of Building Const.
Siloam Springs, Arkansas 72761

Kansas State College of Pittsburg
* Building Technology Dept.
Pittsburg, Kansas 66762

Dr. J. W. Saunders Jr.
West Virginia University
Dept. of Civil Eng.
Morgantown, West Virginia
26506

Dr. J. A. Schaefer
Loras College, Physics Dept.
1450 Alta Vista
Dubuque, Iowa 52001

Dr. D. Vannoy
University of Maryland
Dept. of Civil Eng.
College Park, Maryland
20742

Dr. C. A. Wright
Florida A & M University
Civil Eng. Tech.
Tallahassee, Florida 32307

U.S.A.

Mr. E. L. Bidwell
Univ. of South California
Civil Eng. Dept., Los Angeles, Cal. 90007

Michigan State Univ.
Bldg. Const. Programme
Dept. of Agricultural Eng.
East Lansing, Michigan 48824

Mr. W. H. Douglas, Jr.
University of Kansas
Civil Eng.
Lawrence, Kansas 66045
U.S.A.

J. White
School of Architecture & Urban
Planning
Univ. of Wisconsin-Milwaukee
Milwaukee, WI 53201, U.S.A.

* G. H. Albright, Dept. of Arch. Eng.
Penn State Univ.
101 Eng. "A" Bldg. Univ. Park PA 16802

Mr. N. B. H. Benjamin
Dept. of Civil Eng.
Univ. of Missouri
Columbia, Missouri 65201

Head, Civil
California State
Long Beach
1250 Belleflower Blvd.
Long Beach, California
90840

R. E. Johnson
Asst Professor, Univ. of
Michigan
Architectural Res Lab
Ann Arbor, MI 48109

Prof. F. T. Smothers
Dept. of Architecture
Louisiana State Univ.
Baton Rouge, Louisiana 70803

Mr. S. J. Kimball
Pennsylvania State University
Altoona, Campus
Altoona, Penn 16603

Mr. P. Ray
Tuskegee Inst.
School of Eng.
Tuskegee Inst. Alabama

* M.I. Guest, Pro. Chairman
Dept. of Construction
Bradley Univ.
1501 W. Bradley Ave.
Peoria, IL 61625, U.S.A.

AFRICA

Mr. T. Olivier
Dept. of Building Science
Univ. of the Witwatersrand
Johannesburg 2001
S. Africa

* A. C. Hauptfleisch
Dept. of Building Mgmt
University of Pretoria
Pretoria, S. Africa

* R. G. Sfakianos
Civil Eng. Ind. Training Bd.
Proviate Bag 1
Gardenview 2047
S. Africa

Trevor W. Miners
National Bldg. Research Inst.
P.O. Box 395
Pretoria 0001, South Africa

* Dr. M. Vorster
Univ. of Capetown
Private Bag, Rondebosch 7700
Capetown, Republic of South Africa

KOREA

Prof. H. C. Kim
Architectural Inst. of Korea
No. 2-7 2-Ka Myung-Dong
Chung-Ku, Seoul 100, Korea

THAILAND

Pisidhi Krsasudhi
Asian Institute of Technology
P.O. Box 2754
Bangkok, Thailand

INDIA

Prof. D. Mohan
University of Roorkee
Roorkee, U.P.
India

Director(Training)
Cement Research Institute of India
M-10 South Extension Part 11
Ring Road
New Delhi 110 049
India

SINGAPORE

- * National Univ. of Singapore
Faculty of Architecture & Bldg.
Kent Ridge
Singapore 0511
Republic of Singapore

JAPAN

- * Dr. T. Eguchi
Masashi Institute of Technology
Tokyo, Japan
- * Kazuhiro Yoshikawa, Prof.
Dept. of Civil Engineering
KYOTO University
Yoshida-Honmachi, Sakyo-ku
KYOTO 606, Japan
- * Takeuaka Komnteu Co., Ltd.
Technical Research Laboratory
5-14, 2-chome
Minamisunr, Ko To-Ko
Tokyo, Japan

ISRAEL

M. Omri
Inst. for Training & Productivity in Building
P.O. B. 29744
Tel-Aviv

A. Brill
Dev. & Constr. Dept.
Teh Hebrew University
Jerusalem, Israel

N. Granot
Building Center of Israel
Tel-Aviv
Israel

T. Blechman
Building Research Station
Technion Haifa, Israel

★ Prof. S. Pe'er and Prof. D. Armon
Techion-Israel Institute of Technology
Faculty of Civil Engineering
Technion City, Haifa 32-0000, Israel

H. Shoham
Ben-Gurion Univ. of the Negev
P.O. B. 653
Beer-Sheva

Mordecai Hareli, Bldg. Centre of Israel
4 Hankin Str.
Holon

TURKEY

Y. Sey
Istanbul Technical University
Faculty of Architectur
Building Research Centre
Istanbul, Turkey

V. D. Sorguc
Tech. Univ. of Istanbul
Insaat Fakultesi
Taksim (Taskisla)
Istanbul, Turkey

Prof. Dr. - ING. V. Dogan Sorguc
Technical University of Istanbul
Faculty of Civil Engineering
I.T.U. Insaat Fakultesi, Taci Isletmesi Kursusu
Taskisla
Istanbul, Turkey

Dr. D. Arditi, Asst. Prof. of Civil Eng.
Head of the Division of Construction Strategt
Middle East Technical University
Faculty of Engineering, Department of Civil Engineering
Division of Construction Strategy, Ankara, Turkey

BRITISH ISLES

* Prof. B. Whitehead
Dept. of Bldg. Engineering
Muspratt Lab. U. of Liverpool
P.O. Box 147 Liverpool, L69 3BX

Prof. W. D. Biggs
Dept. of Const. Mgmt.
The University of Reading
Whiteknights
Reading RG6 2BU
U.K.

* Prof. D. Bishop
Bartless School of Architecture & Planning
University College London
Wates House
22 Gordon Street
London WC1H 0QB
U.K.

* Prof. V. B. Torrance
Dept. of Building
Heriot-Watt University
Chamber Street
Edinburgh, EH1 1XX
U.K.

Prof. G. Trimble
Dept. of Civil Eng.
Univ. of Technology
Loughborough
Leicestershire LE11 3TH
U.K.

Prof. R. Pilcher
Inst. of Science & Technology
University of Manchester
Sackville St., P.O. Box 88
Manchester M60 1ZD England

David W. Birchall
Administrative Staff College, Greenlands
Henley-on-Thames, Oxon RG9 6AU
England

M. Pszenicki
50 Netherall
London, England
NW3 5RG

Dept. of Civil Eng.
Nottingham University
Universit Park
Nottingham, England

Head
Dept. of Civil Eng.
The University of Birmingham
Edgbaston B15 2TT
Birmingham, Great Britain

Head, Dept. of Civil Engineering
University of Stirling
Stirling FK9 4LA
United Kingdom

IRELAND

* Kevin Fox
Dublin Inst. of Technology
* Bottom Street
Dublin 1, Ireland

GERMANY, HUNGARY, FRANCE

Mr. G. Dresel
Institut fur Arbeits-und
Baubetriebswissenschaft
(IFA) D7250 Leonberg
Berlinerstr. 40, West Germany

H. Bauer
Lehrstuhl fuer Baubetrieb
Universitat Dortmund
D 4600 Dortmund 50
West Germany

* Prof. A. Schub
Institut fur Bauingenieurwesen IV
Tunnelbau und Baubetriebslehre
ArcisstraBe 21, 8000 Muenchen 2
Fed Rep. Germany

* Professor R. Seeling
Planungsverfahren im Baubetrieb
Technische Hochschule Aachen
Mies-van-der Rohe-StraBe 1
D-5100 Aachen, Germany

Professor K. Simons
Lehrstuhl fur Bauwirtschaft und Baubetrieb
Technische Universitat Braunschweig
Postfach 33, 29
D-3300 Braunschweig, Germany

Dr. Hans Dieter Drechster
Deutsche Gesellschaft fur Technische Zusammenarbeit
In den Eichen 64
D-6237 Liederbach
W. Germany

Dr. J. Denes
Deputy Head of Scientific Div.
Inst. of Bldg. Economy & Organ
Budapest H-1251. Pf. 46
Hungary

M. Gerard Blachere
39 Ave. d'Iena
75116 - Paris

Professor B. Roy, Directeur
Laboratoire de Management
Scientifique et Aide de la
Decision
Place du Mal de Lattre de
Tassigny
75016 Paris, France
Bureaux p. 617

Colette Roland
Universite Nancy 2
42 av'de Libe'ration
54000 Nancy, France

* School of Economics Experts
Inst. of Postgraduate Studies
at K.M.V.Economics
P.O.B 275 H1431
Budapest, Hungary

* Technical Univ. of Budapest
Faculty of Architecture
School of Contractor Experts
Muegyetem Aakpart 1-3
Budapest, Hungary

* Technical Univ. of Budapest
Faculty of Mechanical Eng.
Division of Const. Mgmt
Budapest, Muegyetem rkp 1-3
Hungary

HOLLAND

- * Professor L. P. Sikkel
Dept. of Architecture & Building
Technical University of Eindhoven
P.O. Box 513
5600 MB Eindhoven
Holland

- * Ir. D.W. Greven, M.Sc.
Delft University of Technology
Dept. of Civil Eng.
Section of Construction and Management
Stevinwegl, Delft, Holland

H.vanden Born
Bouwcentrum International Education
Weena 700
3014 DA Rotterdam, Holland

Dr. Willem J. Diepereen, Director General
Stichting Bouwresearch
Weena 740
Ro Herdam, Holland

SWEDEN

- * Professor H.G. Rahm
Institut for byggnadseconomi &
byggnadsorganisation
Chalmars tekniska Hogskola
Fack 402 20
Goteborg 5, Sweden

- * Professor Y. Hammarlund
Institut for byggnadseconomi &
byggnadsorganisation
Chalmars tekniska Hogskola
Fack 402 20
Goteborg 5, Sweden

- * Sten E. Wallin
Lund Institute of Technology
P.O.B. 725
S-220 07 Lund 7
Sweden

DENMARK

Professor A. Gaarslev
Dept. of Construction Management
The Technical University of Denmark
Building 115
2800 Lyngby, Denmark

NORWAY

- * Professor R. Hugsted
Norges Tekniske Hogskole
Institut for Anleggsdrift
Trondheim, Norway

SWITZERLAND

Prof. Dr. A. Pozzi
Institut fur Bauplanning und Baubetrieb
ETH - Honggerberg
CH-8093 Zurich
Switzerland

GREECE

Prof. Dr. P. A. Drakotos
University of Patras
Patras, Greece

POLAND

Prof. Leon Zebrowski
Instytut Organizacj
Zarzadzania i Ekonimiki
Przemyslu Budowlanego
00-950 Warsqawa, ul. Filtrowa 1
Polond

Prof. Jan Weglarz
Technical University of Poznan
Piotrowo 3A
PL - 60965 Poznan
Polond

EAST GERMANY

Prof. Dr. Kurt Fiedler
Technische Hochschn Le Leipzig
Karl-Liebtnecht-Strasse 132
DDR-703 Leipzig
East Germany

AUSTRIA

Professor H. Lessmann
Institut fur Baubetrieb
Technische Universitat Innsbruck
Technikerstr 13
A- 6020 Innsbruck, Austria

W. Jurecka
Technische Universitaet Wien
Institut fuer Baubetrieb und Bauwirtschaft
1040 Wien, Argentinierstr 8, Austria

ROMANIA

Dr. Ing. Eugen Beiu
Dept. of Civil Engineering
Polytechnic Inst. of Cluj
Strada Emil Isac 15, Romania

NEW ZEALAND, AUSTRALIA.

Professor R. W. Woodhead, Prof. of Civil Eng.
The University of New South Wales
Faculty of Eng., School of Civil Eng.
Dept. of Eng. Construction and Management
Box 1 P.O. Kensington, N.S.W. 2033, Australia

Vernon Ireland
The New South Wales Institute of Technology
P.O. Box 123
Broadway, N.S.W. 1007
Australia

Peter Morgan
Dept. of Civil Eng.
Univ. of Melbourne
Parkville, 3052, Victoria
Australia

Ms. Helen Tippet
School of Architecture
Victoria University of Wellington
Private Bag
Wellington, New Zealand